WORD PROCESSORS – THE ULTIMATE BUYERS' GUIDE, PAGES 15-32

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AMIGA SHOPPER

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ISSUE 6 ● OCTOBER 1991 ● YOUR SERIOUS AMIGA GUIDE

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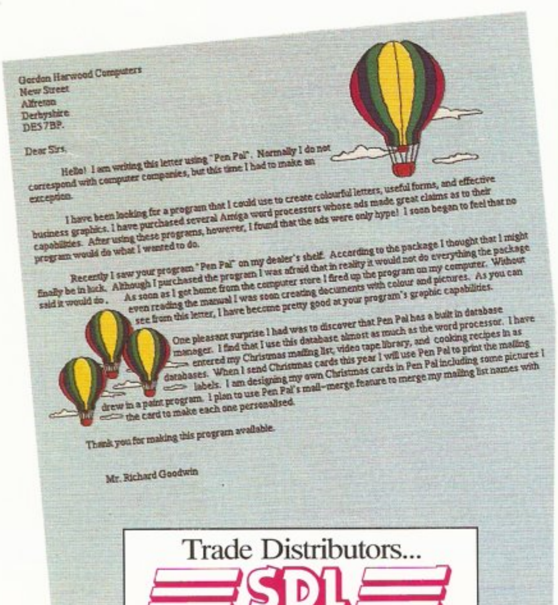
."...its handling of graphics is unsurpassed: Pen Pal is the only program I tested that will automatically wrap text around graphics..." *Amiga World...Jul. '90*

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"...I am extremely pleased with your product especially the Graphic Capabilities within the Word Processor. Having the Database on the same disk has made PEN PAL the best program I have..." *D.S.B., Plumstead, LONDON*

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DE5 7BP.

Dear Sirs,

Hello! I am writing this letter using "Pen Pal". Normally I do not correspond with computer companies, but this time I had to make an exception.

I have been looking for a program that I could use to create colourful letters, useful forms, and effective business graphics. I have purchased several Amiga word processors whose ads made great claims as to their capabilities. After using these programs, however, I found that the ads were only hype! I soon began to feel that no program would do what I wanted to do.

Recently I saw your program "Pen Pal" on my dealer's shelf. According to the package I thought that I might finally be in luck. Although I purchased the program I was afraid that in reality it would not do everything the package said it would do. As soon as I got home from the computer store I fired up the program on my computer. Without even reading the manual I was soon creating documents with colour and pictures. As you can see from this letter, I have become pretty good at your program's graphic capabilities.

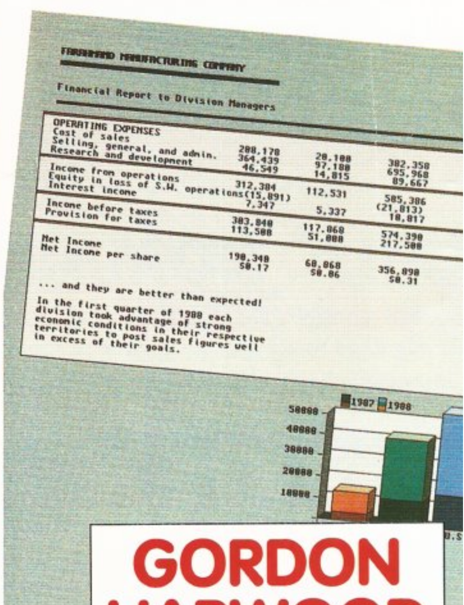
One pleasant surprise I had was to discover that Pen Pal has a built in database manager. I find that I use this database almost as much as the word processor. I have entered my Christmas mailing list, video tape library, and cooking recipes in as databases. When I send Christmas cards this year I will use Pen Pal to print the mailing labels. I am designing my own Christmas cards in Pen Pal including some pictures I drew in a paint program. I plan to use Pen Pal's mail-merge feature to merge my mailing list names with the card to make each one personalised.

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AMIGA SHOPPER AT A GLANCE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 49. The page numbers given are for the first page of the article in which the product is mentioned.

WELCOME

Welcome to the October issue of *Amiga Shopper* – our biggest issue yet. This month, we concentrate on what is far and away the most commonly used piece of computer software: the word processor.

Because everyone needs one, the huge market has spawned a vast range of software. To encourage you to buy their product, software companies have added feature after feature to their programs. Spelling checkers are *de rigueur*, it's not unusual to have a built-in thesaurus and many programs can place graphics on the page, leaving them little short of DTP packages. All this leaves the user in a quandary. There are so many programs, many offering similar facilities, all claiming to be the best, so which one should you buy? We answer that question in this issue.

In one of the biggest group tests ever done in the Amiga world, starting on page 15, we examine no less than 11 leading programs. Amiga publishing expert Jeff Walker compares their facilities: he looks at the graphics features offered by the programs, how easy they are to use and the way they handle printed output. This article will make your choice much easier.

Also is this issue we have a UK exclusive – the first review of NewTek's amazing Video Toaster. This device has been hitting the headlines since its US debut, and having played with it for the last few weeks it's easy to see why. For an extremely affordable price, the Toaster allows an Amiga access to the world of desktop video and 16 million colour graphics. It's a genlock (a device which allows you to add computer images to a video signal), but it's much more than that. Turn to page 34 to see what our graphics experts Gary Whiteley and Phil South made of it.

Finally, regular readers may notice that we've made a few changes to the appearance of *Amiga Shopper*. This has been done with one reason in mind – to make the magazine clearer and easier to read. I hope you like the new look, and agree that *Amiga Shopper* is now even better value.

Stuart Anderton

Editor

PUBLIC DOMAIN WORLD

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them. This month PD expert Phil South reviews:

MessyDOS • Module Processor • Intuimenu • Master Virus Killer • Words • ACC Assembler • Four Seasons • MED • Sprite Designer • HAMsharp • AmiGIF • Coders Club • TBAG • The Wall • Landing • Total destruction • Ice • Virtual World • Llamatron

ENTER THE PD WORLD ON PAGE 124

AMIGA ANSWERS

SIXTEEN PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. This month we solve problems on:

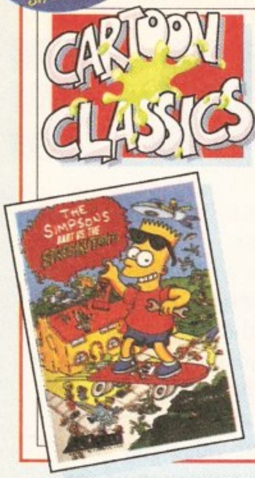
Hard drives • Genlocks • Starting in business • Transferring files • RAM upgrades • Deluxe Music • Assembler • Printing pictures • Hardware faults • Date stamping • Saving files • PD animations • Converting graphics • Programming errors • Tone dialling • AmigaDOS commands • Music files • A2000 compatibility • ARexx • Reading the keyboard • Editing icons • and many, many more.

THE ANSWERS START ON PAGE 49

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

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Issue 6 October 1991

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Art Editor: **Jacquie Spanton**
Production Editor: **Ian Wrigley**
Technical Editor: **Cliff Ramshaw**
Consultant Editors: **Jeff Walker, Mark Smiddy, Phil South**
Contributors: **Sam Littlewood, Jon Bates, Pat Winstanley, Paul Andreas Overaa, Gary Whiteley, Jolyon Ralph, Stewart Russell, Mick Draycott, Jason Holborn**
Ad Manager: **Margaret Clarke**
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Illustrations: **Kev Sutherland, Jolyon Webb**
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Production Technicians: **Simon Windsor, Chris Stocker, Jerome Clough**
Promotions Manager: **Michele Harris**
Publishers' Assistant: **Tamara Ward**
Circulation Director: **Sue Hartley**
Group Publishing Director: **Greg Ingham**

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Editorial
30 Monmouth Street,
Bath BA1 2BW
Tel: 0225 442244
Fax: 0225 446019
E-mail:
amshopper@cix.compulink.co.uk

Advertising
Rayner House, 23 Higher Hillgate,
Stockport SK1 3ER
Tel: 061-474 7333
Fax: 061-476 3002

Subscriptions
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In Brief

TURNING JAPANESE
CDTV is swinging into action in a school in Derbyshire, where it is being used to teach students Japanese as part of the Japan World Project. The project will be available to all schools in Derbyshire throughout the autumn.

DOUBLE IMAGE
The Golden Image Hand Scanner is now in its second incarnation.

Although the hardware remains the same, the bundled software, Migraph *Touch-Up*, has now been upgraded to version 1.1; with the whole package being renamed as the Mark II Hand Scanner.

An upgrade for existing users is available for £15. A price for the package as a whole is yet to be finalised, but will be between £155 and £160. Golden Image ☎ 081-518 7373.

NEW LASER
Desktop publishing enthusiasts will be interested to learn of the new VM800 laser printer from Fujitsu.

The printer operates in HP Laserjet III emulation, printing eight A4 pages per minute. Included as standard are seven bitmap fonts and eight scalable typefaces. Further fonts can be obtained by the addition of forthcoming cartridges. The VM800 costs £1,426. Fujitsu ☎ 081-573 4444.

MORE MATHS
LCL, the educational software house, has released a new version of its *Micro Maths* package this month.

The package adheres to the GCSE syllabus, making use of sound and graphics to retain the students' interest. Those owning the old version can upgrade for £5; the program costs £24 for new users. LCL ☎ 0491 579345.

London show is no go



The European Computer Entertainment Show: a no go area.

IN A SUDDEN change of plan, the European Computer Entertainment Show, scheduled for this weekend (September 7) will not be open to the public this year.

The Earls Court event, which last year attracted thousands of computer owners to see the latest games and hardware, has been made trade only because of the decline in interest from the software companies. EMAP, the firm organising the show, is urging people to stay away to avoid disappointment.

Meanwhile, the November World of Commodore show, sponsored by *Amiga Format*, is all set to go ahead as planned. Despite the lack of enthusiasm of software companies for the ECES, they are expected to be at World of Commodore in force. The show will also feature far more applications software and innovative hardware than the cancelled games-only event.

The World of Commodore Show runs from November 15-17 at Earls Court 2 in London.

Commodore pushes multimedia centres

IN AN ATTEMPT to consolidate its lead over Philips and other competitors, Commodore has announced its commitment to opening a nationwide network of 12 multimedia centres over the next three years.

With CDTV already launched, and the current success of the Amiga in video, Commodore is no doubt keen to gain what share it can of the burgeoning multimedia market before the UK launch of Philips' higher specified CD-I multimedia machine. Clearly the company is making a substantial financial investment towards this end. The centres are planned to be formed in partnership with existing independent retailers, but will be devoted entirely to Commodore multimedia 'solutions'. The concept is similar to that of the high-street AppleCentres, and should link Commodore's name to multimedia in the minds of the public.

PRAGMATIC

Of course, the more pragmatic aim is to sell kit. To this end, Commodore intends to begin a series of training courses starting in September which will familiarise sales people with the technology and enable them to analyse customers' needs and suggest appropriate ways of satisfying them. Customers are expected to range from specialist developers right up to corporate users. The entire Amiga range plus all relevant peripherals will be stocked, along with Commodore's CDTV system.

The training courses are not only open to dealers participating in the multimedia centre scheme, but to anyone who is interested. In this case, the price of such training will depend on the nature of the dealer in question. Training will take place at a special facility at Milton Keynes, or may be given on-site.

PLATFORMS

Speaking of 'platforms' other than those produced by Commodore to produce 'true multimedia solutions', Terry Cooke, Commodore's national sales director, likened it to "teaching a dog to walk on two legs, because whilst you can probably do it, the solution takes an awful lot of money and patience." With its frequent use of the phrases 'platforms' and 'multimedia solutions' Commodore is making an attempt to gain credibility in the high-powered world of business, where computer systems are referred to as anything but 'computer systems'.

In contrast to this is Commodore's definition of multimedia: "a method of designing and integrating computer technologies on a single platform allowing a user to input, create, manipulate and output text, graphics, audio and video, utilising a single user interface." It seems strange that the emphasis should be on the designing of machines, rather than on the machines themselves or the information they are to process. Such mild marketing confusions are not unknown to Commodore.

Amiga access enabled

THE TOUCAN LEARNING Tray, for severely disabled computer users, is now being marketed for the Amiga by Think Limited.

Once the Tray is connected, users can communicate with standard Amiga programs via a selection of standard switching input devices, the response of which can be tailored according to the program in use. In this way, people such as cerebral palsy sufferers can use the Amiga to its full. The board is manufactured by Toucan Communications, and marketed with Amiga software for £750 by Think Limited.

This is the same company which markets the Alfred Robotic Arm, which is currently being sold with a rotary table for the special price of £468.83. Think Limited can be contacted on on ☎ 021- 384 4168.

News compiled by Cliff Ramshaw

Put your foot to the floor

IT'S ROCKET FUEL time for A500 owners with the introduction of a new accelerator board from MicroBotics.

The board comes with a Motorola 68030 processor, clocked at a variety of speeds from 16MHz upwards. An optional maths co-processor can also be fitted, either synchronised with the CPU or clocked from its own oscillator for speeds of up to 60MHz.

The board fits inside the A500 (although it will also fit an A1500 or A2000) in the 68000 processor slot, which is itself relocated on the board. It is possible to switch between the two modes.

A 32-bit processor such as the 68030 works best with 32-bit memory. Such a board is available from MicroBotics, and attaches to a head connector on the accelerator board. The memory board will hold either 2Mb or 8Mb.

A 25MHz card costs £299. From ZCL ☎ 0543 414817.

Fonts on tap

THOSE AMIGA DESKTOP publishers who look with envy at the variety of PostScript fonts available for the Mac and PC can now get in on the act themselves with *MIoutline* from Mirror Image Productions.

MIoutline takes PostScript Type 1 printer fonts and converts them into an outline font suitable for use in Gold Disk's *Professional Draw* structured drawing program. From there, it is possible to manipulate and edit the fonts for the creation of specialised logos and so forth. As it can be difficult to obtain a particular character in a font, *MIoutline* has the ability to generate a chart of a font's complete character set, along with the key combinations necessary to access each character.

Mirror Image Productions also sells *MIfont*, a sister program to *MIoutline*, which will convert PostScript fonts to screen fonts for use in *Professional Page*. *MIfont* costs $105; *MIoutline* costs $124.95. Both are currently only available from Mirror Image in Canada ☎ 010 1 416 495 7469.

Audition passes

SUNRIZE'S *AUDITION 4* sound editor program, announced in *Amiga Shopper* issue three, is now available.

As well as the many features expected of a sample editor, the program has the facility to create sequenced loops and preview effects before applying them to a sound. Everything is displayed graphically under Intuition, making it easy to zoom in on mouse-selected portions of sound for precision editing.

The program is written in assembly language, producing a compact (about 100K) and fast product. It costs £49.99 and is distributed in the UK by HB Marketing ☎ 0753 686000.

Popular US MIDI software gets an overhaul

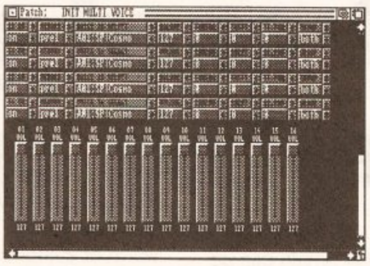
DrT's helpline aids musicians

DISTRIBUTION OF THE popular range of music software from Dr T's has been awarded to the UK company Zone Distribution. The company has set up a technical help line for users of Dr T's software.

Existing users of Dr T's products can register with Zone in order to benefit from this service, providing that they can prove that they have a legitimate copy of the software. The help line is manned Monday to Friday between 11am and 4pm, on ☎ 081-699 8074.

Coinciding with this is a new release and a product update from Dr T's. The new product is *X-Or*, a patch editor/librarian which has been available for some time on the ST and PC. Using the program, it is possible to edit sounds for over 90 synthesizers by a system of synthesizer profiles which are continuously being updated by Dr T's. Most synths come with a tiny LCD screen and a limited set of keys for sound editing; using a computer to display parameters in the form of graphical sliders and draw envelopes and sound objects can greatly ease the process of editing. As well as this, the program enables the copying of patches from one synth bank to another, and the playing of MIDI files while in the midst of editing. *X-Or* costs £219.

The update is for *KCS*, the Amiga sequencing package, now at version 3.5. It boasts a re-designed front panel and many new features, including the facility to play IFF samples, 48 track sequencing, real-time graphic editing, 16 stave transcription to screen and printer, and synchronisation to SMPTE through Dr T's Phantom Synchroniser (a £249 hardware add-on giving SMPTE read/write information). *KCS* 3.5 costs £279. Alternatively, users of *Music-X*, *Master Tracks Pro* or *Bars and Pipes* can trade in their old programs against *KCS* for £149. Owners of *Tiger Cub*, *MRS* and *Sequencer 1* can do the same for £179.

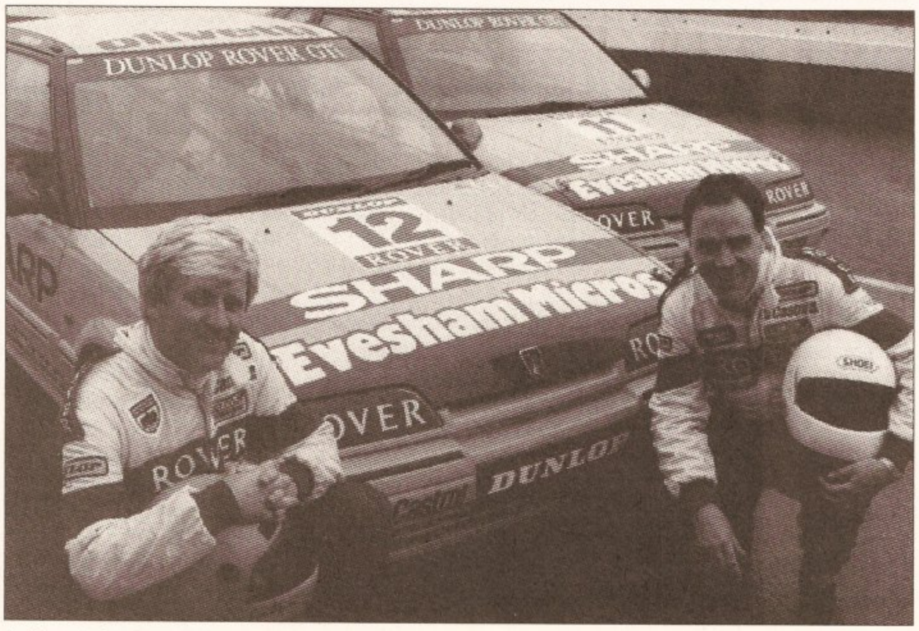


***X-Or* from DrT: new version out.**

Also coming under the wing of Zone Distribution is the song library from Trycho Tunes. This consist of disks containing MIDI files for popular hardware and software sequencers and drum machines. Prices decrease depending on the size of the order, but a single song costs £7.95. Songs can be bought in related packs of three and ten for £12.95 and £39.95 respectively. As well as current hits, the library boasts a large selection of golden oldies.

Zone has also taken over the distribution of the MIDIman range of products, which consists largely MIDI and SMPTE hardware units for the professional musician. Zone Distribution is on ☎ 081-766 6564.

• ***X-Or* is reviewed on page 104.**



A day at the races with the Evesham Micros team, seen here hunkering down after a hard drive (sorry) in the Dunlop Rover GTI challenge at Donington Park last month. On the left is race winning (and championship leading) driver Dave Loudon, on the right Evesham Micros' boss Richard Austin, who came in ninth.

In Brief

SCALA UPGRADED

***Scala*, the presentation package, has just been upgraded to version 1.1.**

When reviewed in *Amiga Shopper* issue two, the package received a rating of 82 out of 100 from Gary Whiteley, who predicted a "bright future" for it. Now the package makes an even more attractive proposition. Among its numerous new features are ARexx support, real-time anti-aliasing of text and brushes and real-time buffering of ANIMs.

The new package costs £264.38 from Silica Systems ☎ 081-309 1111. Existing users of *Scala* can obtain a free upgrade by sending their original master program disk to Silica at 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX.

PD FOR FREE

Neural Images PD will gave away a free disk of PD software to anyone who sends the company an SAE. Neural Images PD ☎ 0429 263508.

PRINTER PRICE CUT

If you were considering buying the NEC P70 printer, you will be pleased to know that its price has just been dropped. Previously available for £799, the printer can now be obtained for a paltry £699.

The printer is a 24-pin wide carriage model, capable of taking A3 landscape paper and printing up to 136 columns of text. Other features include an 80K print buffer and 10 resident fonts. NEC can be contacted on ☎ 081-993 8111.

OVER THE TOP

Cardboard overlays which fit over the top of the Amiga keyboard allowing you to make notes of common commands and shortcuts are available from Silverbird, priced at £5.00 for five. Silverbird ☎ 05255 2614.

In Brief

PANASONIC PRINTER APPEARS

Another printer hits the market this month, this time from Panasonic. The KX-P1170 is a 9-pin model costing £233.83.

As with most printers in the range, it offers both draft and near letter quality print, at a claimed maximum speed of 192 characters per second in any of four fonts. As well as continuous or single sheet paper, the printer can handle envelopes, labels and multi-part stationery. It comes with a 6K buffer as standard, with an extra 32K available as an option for £76.38. Interface to the Amiga is via the parallel port, or with an optional RS-232C connection to the serial port. Panasonic can be contacted on ☎ 0344 853915.

VIRAL WARRIORS

Each year sees more and more viruses, each more sophisticated than those before.

A new organisation has been formed by businesses and a number of individuals to combat this menace. Called the Virus Advisory Service, it offers free advice to those wanting to know more about these small but devastating programs. The service offers information both on prevention of infection and cure of any existing problems. The Virus Advisory Service is on ☎ 0705 851645.

SAMPLER SOURCE

We would like to point out that the Sound Trap 3 sound sampler, as reviewed in issue five, is available direct from the manufacturer, Omega Projects ☎ 0925 763946.

NAME GAME

Yet another firm is being mistaken for crashed company SCS. This time it's Start Computer Systems in Sunderland. Why do so many northern companies have such similar names...?

Learning to tickle the digital ivories

THE FIRST KEYBOARD teaching package is about to be launched by Nintendo for the Amiga, based around a stand-alone single keyboard with over 100 instruments and effects plus MIDI. However the smart part is the interface and software which will teach you to play the instrument, taking you through to a high standard of competence.

The Miracle Piano Teaching System actually customises itself to your strengths and weaknesses as you progress through the 300-plus lessons and repertoire of over 50 songs. It teaches the user to play the keyboard through a series of on-screen tutorials, games and computer-accompanied tunes.

Many of the skills that you need to learn – note and rhythm recognition, fingering and so on – are taught using screens that make full use of the Amiga's graphic capability and could have been taken from any arcade game.

The keyboard has 4 octaves of velocity-sensitive keys, full stereo sound and comes complete with a sustain foot pedal. Since it is multi-timbral it can flesh out the tune you are learning with a full-blown accompaniment. Advanced lessons take the use of sustain and touch sensitivity into account. Although the keyboard has MIDI capabilities, it uses a separate interface to communicate with the software. Mindscape/Nintendo ☎ 0444 246333.

CSA's add-on provides 25MHz 68040 power

'040 card gives blistering speed

WITH A LEAP and a bound your Amiga can be transformed into a soaring 68040 supercomputer with a new accelerator board from CSA, which also makes the Mega Midget Racer 68030 board.

The 68040 is one of the biggest and most powerful processors in production; even clocked at 25MHz, as it is in this case, it gives a performance of 20 MIPS (million instructions per second). The board, named the 040 Magnum, provides more than simple acceleration, however: it is almost a computer in its own right. It comes with a SCSI interface and its own parallel and serial ports, all linked directly to the 68040 bus for blinding speed (they are, unfortunately, unusable by the 68000).

The board comes with 1Mb of shadow RAM, which may be used to contain Kickstart 2.0 (which has an 040 mode) as well as 512K-worth of customisation programs. Bytes and Pieces, which is distributing the board in the UK and Europe, says that in the unlikely event that Commodore has not begun shipping Kickstart 2.0 when the board is released, it will provide a developers' version of Kickstart with the board on the condition that users upgrade to the official Commodore version when available.

A further 4Mb of true 32-bit RAM is supplied on-board, with the option to expand to either 16Mb using 4Mb chips or 64Mb using 16Mb chips.

The board fits into the processor slot of a revision 6.2 B2000 or an A1500. A hardware switch selects whether the 68000 or the board will be used by the Amiga. It will be available in October, at an expected price of around £2,500. Bytes and Pieces can be contacted on ☎ 0253 795376.

Tiny printer turns on the heat

AMIGA OWNERS REQUIRING a portable printer will be interested in the H200 from Ferrotec, which measures a diminutive 320 by 130 by 71mm.

The printer uses a thermal head mechanism and will print both text and graphics. It emulates both the IBM Proprinter and the Epson LQ. Paper comes in the form of rolls, with each roll providing 70 pages 11 inches in length. The paper is 8 inches wide, but this is apparently increased to 8.5 inches via software means (this we would love to see). Power is provided by means of a transformer or rechargeable battery packs.

It supports a variety fonts – Pica, Courier, Roman, Proportional and Standard – in bold, expanded, condensed and double size styles. Super and sub-script, underlining and overlining are also possible. Print speed is a claimed 220 characters per second in near letter quality mode, 170 cps for letter quality.

Ferrotec will also be supplying a number of plug-in cards for the printer, one of which will print a user-defined message or company logo every time the machine is used.

Ferrotec, a company more usually associated with disk drive manufacture, can be contacted on ☎ 010 353 1 2952529. Alternatively, Applied Business Computing, the first appointed distributor for the printer, can be contacted on ☎ 0609 777000.

Making the news? Make the call: 0225 442244

DRAWN IN THE USA

TWO NEW COLLECTIONS from Innovatronics hit the Amiga art scene – such as it is – this month.

The first is a three disk set called *Canvas* (volume one of a forthcoming series). It contains five full-screen pictures and 13 animations by Ryan Roberts, the Warner Brothers artist/animator. The subjects are animals and fantasy characters. At around £30 for the set, the quality of the images will have to be substantially better than that of those available in the public domain. Whether there is actually a market for pre-drawn clip-art images remains to be seen – but Innovatronics in optimistic.

Users who prefer to get a little more involved with their computer software may be more interested in the *Lunar Construction Set*, also by Ryan Roberts. This is a two-disk set of clip art, designed for the creation of lunar and space scenes. A selection of pictures and animations is included to provide examples of how the components may be used. In addition, there are also help screens showing step by step instructions on the creation of asteroids and various lunar features. In total, the package contains 183 clips, 24 pictures and 10 animations.

Both packages will be marketed by Checkmate Digital ☎ 071-923 0658. UK Prices are not yet finalised, but are expected to be in the region of £30 for *Canvas* and £20 for the *Lunar Construction Set*.

COMMODORE-
THE WORLD AT YOUR FINGERTIPS

AMIGA 1500

With Commodore's exciting new 1500 pack you get everything you've ever wanted in a home computer – including the software.

The Amiga 1500 is the ultimate PC for all the family, bringing the world of computers into your home. Ease of use is designed into all Amiga's award winning technology and to make it even simpler the 1500 comes with its own straight-forward guide, 'Get the Most out of your Amiga'.

To help you do just that you also get six software packages encompassing business, design, education and leisure. You can monitor your finances with the 'Digita Home Accounts' software, or allow your design skills free rein with the sophisticated 'Deluxe Paint III'. And for business, there's 'The Works! Platinum Edition' – a fully integrated word processing, spreadsheet and database package.

For unbeatable entertainment, enter the realms of fantasy with the arcade sensation 'Toki', journey into a land of enchantment in 'Elf', or risk getting hooked on 'Puzznic'.

Commodore – a whole new world which doesn't cost the earth.

£999.00 including VAT

Digita Home Accounts is a trademark of Digita Holdings Limited
Deluxe Paint III is a trademark of Electronic Arts
The Works! is a trademark of Micro Systems Software
Toki, Elf and Puzznic are trademarks of Ocean Software



COMMODORE - THE WORLD AT YOUR FINGERTIPS

Please send me further details.

Name ______________________

Position ______________________

Company ______________________

Address ______________________

____

Postcode ____________ Telephone ____________

Commodore Business Machines (UK) Ltd
Commodore House, The Switchback,
Gardner Road, Maidenhead, Berks SL6 7XA
Tel: 0628 779560. Fax: 0628 71456. Telex: 846057 CBMUKL G.
AS-8/91-22

Commodore

In Brief

INSIDE STORY

An internal hard drive for the A500 has been launched by ICD. The Prima hard drive replaces the Amiga's internal floppy drive and includes an adaptor for converting an external floppy for use as df0: – making it possible to boot from floppy if desired.

The drive is available in two sizes: 52Mb and 105Mb. It will fit into an A500 with at least 1Mb of RAM and an external floppy drive. The 52Mb and 105Mb models cost $649.95 and $899.95 respectively – no UK prices have been fixed. They will be sold by Power Computing amongst others. ICD ☎ 010 1 815 968 2288.

DOING A JIG

***Jigsaw* is an eductional puzzle from Think Ltd. It breaks a picture into pieces and lets you put it back together again. *Slide It!* does a similar trick, but emulates a sliding puzzle. Both cost £19.99. Contact Think at Prudential Buildings, 46C High Street, Erdington B23 6RH.**

STEREO SOUND

GVP continues to add to its series of Amiga hardware products. This month sees the release of a stereo sound sampler and software, called the Digital Sound Studio. All of the usual features are included with the package, which costs $125 in the States.

Also new from GVP is the Impact Vision 24 board – a 24-bit colour board giving more than 16,000,000 colours and coming with a built-in flicker fixer, frame buffer and genlock. The board is designed for the A3000, but it can be used with the A2000 with a video adaptor board. The price is $2,199 in America.

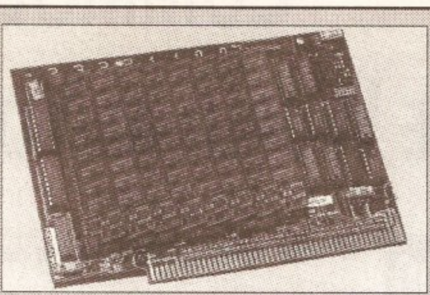
No UK prices yet, but distribution is by Silica Systems ☎ 081-309 1111 and they will be available from major dealers.

RAM takes a flyer

ANOTHER EXPANSION POSSIBILITY emerges with the Dataflyer RAM Card, marketed in this country by Trilogic. The card will hold up to 8Mb of memory, and will plug directly into an A2000 or A1500, or can be fitted to a Dataflyer SCSI interface.

The printed circuit board comprises four layers rather than the conventional two, so that the ground and power lines can be separated from the signal lines and thus provide more reliable performance, the company claims.

The device is compatible with Trilogic's Baseboard, which together gives 10.5Mb of RAM - which should be more than enough for most users.



The Dataflyer RAM card: up to 8Mb.

The board will hold eight 100ns SIMMs, either 256K chips to make 2Mb, or 1Mb chips for 8Mb. The empty board costs £79.99, with 1Mb 100ns RAM chips available at £39.99 each. (Although this price varies frequently.) Trilogic can be reached on ☎ 0274 691115.

Video Blender system offers stunning effects

New products make Progress

PROGRESSIVE PERIPHERALS And Software has been busy recently; a whole host of new products are on their way across the water.

The first is version 2.0 of *3-D Professional*. New features include: configurable screen sizes; boolean merging of objects; both vertex and object level editing; image, attribute and bump mapping; a range of new textures; a real-time editing mode; and rendering improvements both in terms of speed and quality, with the addition of anti-aliasing.

IntroCAD makes a re-appearance in the form of *IntroCAD Plus*, now with ARexx support, user-definable macros and fonts, hatching patterns and 68020/6881 support.

Also re-vamped is *Diskmaster*, the file management utility, now called *Diskmaster II*. It improves on the older version with such facilities as saveable configurations and the ability to display graphics and text files, play sound files and decompress archived files simply by clicking on a file's icon. ARexx support is included.

ACCELERATOR

For the A3000 comes a 68040 accelerator card, clocked at 25MHz. Fitting into the A3000's processor slot, the card provides a speed increase of between three and six times that of the A3000. The card is said to be fully compatible with AmigaDOS 2.0.

QicTape is a hard disk back-up unit. It plugs into the floppy drive port of any Amiga, and with the aid of the supplied software it will copy up to 60Mb of data to a single cartridge tape. More than one cartridge can be used to back-up the drive if needed.

Perhaps the most exciting new release is the Video Blender. This device will work with any Amiga with at least 1Mb of RAM, providing incredible desktop video effects. It produces output from four sources: composite video, RGB video, Amiga graphics and a background colour selectable from a palette of 16,000,000. With any two of these sources it is possible to perform such effects as genlocking, fading, mixing, flicker-free switching, keying, and user-definable wiping. All programmed effects can be saved to a script file for later use.

All Progressive Peripherals And Software products are distributed in this country by Marcam ☎ 081-941 6117 or 0604 790466. Prices had not been fixed as we went to press. Progressive Peripherals And Software is on ☎ 010 1 303 825 4144.

Next month in Amiga Shopper

IN THE NOVEMBER issue of *Amiga Shopper* you'll find a round up of the 3D painting packages available, reviews of *Vista Pro* and the Concept Keyboard, tutorials on programming in C and Basic, and an introduction to Modula-2. Plus the start of a series on MIDI music which will show you how to build your own system on a budget. And we show you how to produce superb artwork with *Deluxe Paint*. The latest video products are tested out, and we explain how to get the best from your DTP system, and... You get the idea – there's so much in *Amiga Shopper* that you can't afford to miss it. And when you remember that it only costs 99p, it has to be the best deal around. It's on sale October 3rd.

DIARY DATES

Shows and exhibitions in the coming months.

September 6-8: European Computer Entertainment Show. Trade only. Earls Court, London. EMAP ☎ 071-404 4844.

September 7: All Formats Computer Fair. Royal Horticultural Hall, London. ☎ 0225 868100.

September 13-15: Leeds Computer Extravaganza. New Exhibition Centre, Leeds University. Capital North ☎ 0532 677657.

September 14: All Formats Computer Fair. National Motorcycle Museum, Solihull. ☎ 0225 868100.

September 22: All Formats Computer Fair. City Hall, Glasgow. ☎ 0225 868100.

October 6: All Formats Computer Fair. The Brunel Centre, Bristol. ☎ 0225 868100.

October 29-31: Image Processing '91. National Exhibition Centre, Birmingham. Blenheim Online ☎ 081-868 4466.

November 5-7: Computer Graphics '91. Alexandra Palace, London. Blenheim Online ☎ 081-868 4466.

November 15-17: *Amiga Format* presents The World Of Commodore. Earls Court 2, London. Details on page 97.

December 5-8: Computer Shopper Show. Wembley Exhibition Halls, London. Cape Cowley Associates ☎ 061-480 9811.

If you have an event you would like listed, write with full details to: Diary Dates, Amiga Shopper, *30 Monmouth Street, Bath BA1 2BW.*

Talking shop

This month there's more discussion about the possibilities of a ROM-based Workbench, and the usual bouquets and brickbats. If you want to express your opinion, write to the editor, Stuart Anderton – you could win £5 if we print your letter!



WHICH ONE TO BUY?

I want to purchase an Amiga in the future, but cannot make up my mind between an A500 and an A1500. I was told that the 1500 is a 500 in a different case with an extra disk drive and 1Mb of RAM as standard. Is this true, as I have not seen or found any tests on the 1500?

David Lea
Slough
Berks

No David, it's not true at all. The 1500 is in fact a 2000 in a different case, which may explain your confused information. The most important difference between the A500 and the A1500 is that the 1500 can take expansion cards containing things like RAM, hard disks and modems, which fit neatly inside the box. More sophisticated devices like the Video Toaster and the PC Bridgeboard can also be fitted. The A1500 is a more professional machine than the A500, which is for home use. If you can wait, we'll be assessing the entire Amiga range and explaining who should buy which machine in issue 8 of* Amiga Shopper*, out in the first week of November.

TA A LOT, MATE

I wish to thank you and all your staff for *Amiga Shopper*. I am new to the computer world, and at 58 years of age I was not sure it was for me.

I was considering a word processor to replace my typewriter and as my married son was well up in these things, I asked him for guidance. Well, little did I realise what I was letting myself in for.

Someone was looking after this "fool". I bought *Amiga User International*, then *Computer Shopper* then *Amiga Format*, and that was £3.95 well spent, then I discovered *Amiga Shopper*. This was what I needed; everything a novice needs. Thank you from the bottom of my heart most sincerely, and I wish you every sucess, for life with my A500 has meaning now.

Bernard C Monteith
Broughshane
Co. Antrim

It's this kind of letter that makes life as a journalist worthwhile...

ON MY RADIO

Having just read the latest issue of *Amiga Shopper* I was pleased to see that you were going to do an article on amateur radio using the Amiga.

I would be interested to know if there are any clubs which cater for the Amiga radio user as most of the radio magazines I buy are all geared around the IBM compatibles.

Keith Elgin
Coleraine
N. Ireland

There is group for radio types, it's called the Commodore Radio Users Group, and the contact is Simon Lewis at 69 Irvine Drive, North Clippens, Linwood, Paisley. On the subject of radio, a bloke who didn't give his name rang me the other day and asked if we wanted to review an Amiga call logging program. If you're reading this Mr X, please send it in!

SNIFFY LETTER

My pen overflows with fulsome praise for your publication but I had better keep it in check or the staff will be in a state of mutiny for higher pay, luncheon vouchers and a three-hour siesta! *(I already have one! – Sub.)*

If you want the kinky bit, let me say that *Amiga Shopper* smells good! For some strange reason a book or mag that smells good is to me a more pleasant read – maybe it's my past association with printers' ink and paper.

Alan Hath
Alassio
Italy

I've read about magazine sniffers, but I never thought one would actually reveal himself in public...

LETTER OF PRAISE

At last! An Amiga magazine that is inexpensive and not obsessed with silly games. I come to computing dragged and screaming, and have wrestled with our Amiga 500 for months with native fear and resentment, utterly put off by the so-called instruction books! However, I have persevered and *Kindwords* and *Pagesetter* have seen my office work and publication work transformed. However, in a previous incarnation I was a marine engineer and like to know why certain things have to be done and what happens when you do. Hence my bewilderment with electronics.

But thanks to your excellent magazine I find intelligent articles (I don't claim to understand them all) and invaluable aids for utter duffers such as myself, e.g. in the August issue I was able to read and understand why disks have to be formatted and what happens when you do. Hitherto nobody – but nobody – has been able to tell me that. Further, your little boxes of Jargon Busting are like oases to me and my like. Please continue your excellent standard. I have placed a regular order.

Rev. Henry Gordon
Tynewydd Road U. R. Church
Rhyll

WARRANTY WARNING

Is your warranty really invalidated if you take the lid off the A1500? One firm assured me that it wasn't, and that it didn't make any difference to my warranty if the machine arrived with its seal already broken. But a leaflet enclosed with the machine giving details of upgrade cards warned that they must be fitted by a dealer. As I am keen to upgrade my machine I would like to clarify this.

Tracey Hartley
Yeovil
Somerset

We asked Commodore to make things clearer, and a spokesman informed us that with "computers designed to have user added options fitted" (ie, the 1500, 2000 and 3000) it would not invalidate the warranty to open the lid. Start pulling chips out, of course, and it's another story, and opening an A500 will kill the warranty instantly.

UNBIASED COMMENTS

Re your products tests. I am amazed to read again and again that companies do not send you their products for review. As a totally unbiased beginner, I shall tell you how I treat this. I know nothing about anything, so I am looking for intelligent, unbiased comments. I know tastes vary – but if something is great, it's great! If a review tests 10 products then I am going to buy one that comes near the top. If a company does not send an item for test I choose to interpret this as either a) they can't be bothered (hmm – not good customer relations) or b) they have something to fear! Either way, because I do not have any information on their product, and I do on others, this will influence my decision. For instance, I am in the process of buying *Wordworth* –

continued on page 13

continued from page 11

I deliberately waited for your August issue before deciding.

I hope my letter helps you get the message across to the manufacturers. I'm sure I'm not alone in my approach!

Frances Bradley
Kirkoswald
Cumbria

Many companies are indeed reluctant to part with their goods, and many more get extremely annoyed when we don't rate their products very highly. I suppose that is to be expected. We try to be as objective as possible in our reviews, and I'm glad to hear that you take them seriously – that's what we're here for!

GROANS ABOUT GAZZA

I suppose John Lennon didn't have computer software in his mind when he wrote *Imagine*. Personally, the raytracing and animation program from Impulse called *Imagine* could inspire me to write some very affectionate poetry.

Having just read Gary Whiteley's review of this program in *Amiga Shopper* issue four, I suppose Whiteley does not share my feelings. In my opinion his somewhat sour review did not manage to express the excellence of the program *Amiga World* (the overly serious American magazine) called a "3D modelling-animation breakthrough". A comparison between the *Imagine* review and the *Real 3D* review in the same issue only emphasises this.

Not only does the much more limited and over £100 more expensive *Real 3D* gain a much more favourable review than *Imagine*, but Whiteley, in his review, completely fails to understand the ingeniousness of the cycle and forms editors, and does not mention the flexibility and easiness of use of the action script. Had Mr Whiteley read the ReadMe file on the program disk properly, he maybe would have noticed the cycle-setup and the cycle-shuffle features. These additions to the program makes the cycle editor something unrivaled by any 3D program on the Amiga.

Concerning the forms editor, although it's true that it is limited, it is certainly not as useless as the review states. After fiddling around with it for a while it's quite easy to make almost anything that has a not too complicated form. I have, for instance, made a human face with this editor. And any two forms with the same number of points and cross sections can be animated to transform from one into the other. When it comes to the animation part of the program, the ability to animate textures, refraction and colour and more is not, I feel, properly discussed in the review.

I could go on for a while like this, because *Imagine* has so many great features to mention. Maybe that is a part of the problem. After all, I have been using the program for at least half a year, whereas I suppose your reviewers have deadlines which they must keep to.

There is a moral in here somewhere: a late but truly in-depth review is better than an early 'scoop' review which can never give justice to such a marvellous and difficult program as *Imagine*. And why didn't Whiteley confront the creators of the program with his difficulties? Impulse's helpline and user-service is impeccable.

Paul Aam
Orsta
Norway

Gary Whiteley replies:
"I have a feeling that I have been a little misinterpreted here. I checked back on my review (both printed and original) and OK, maybe it's my writing style, but in no way was I intending that my so-called 'sour' review would appear to be rubbishing **Imagine.** ***Quotes such as 'I am certainly hooked', 'Imagine can help make your dreams come true' and 'Imagine's current shortcomings would not outweigh its other, excellent, features' don't seem to be that negative to me. I too think that it is a remarkable package, but marred by the omissions and problems which I encountered, not least the manual – which, let's face it, is often the first contact for the new user to learn from. However good Impulse's telephone help-line is, we can't all afford to call the US when something goes wrong.***

"Just to clarify things further, I spent a very intensive three weeks examining the software (having previously been using **Turbo Silver 3** ***as my modeller and animator of choice). If I could not use a feature instantly I went back, read the docs and manual once more and tried again – and again. I even went through all the tutorials three times each to try to follow them fully. And I was trying to be honest about those things which let*** **Imagine** ***down, in my opinion.***

"Phil's opinion about **Real 3D** ***is nothing to do with me. Different strokes for different folks, I'm afraid. Even though he might just be wrong... though of course that's only my opinion!"***

ON THE OTHER HAND..

Please thank Gary Whiteley for all his excellent articles, reviews and answers about video on the Amiga. It's nice to know I'm not the only one trying to bolt the two together.

Glenn Somerset
Sheffield

There you go Gary, at least somebody loves you! AS

ROMMING AROUND

Letters replying to the letter from Gareth Perch in issue four, in which he suggested that Workbench could be incorporated into a cartridge to save inserting a disk every time the Amiga is switched on, continue to pour in. Here is a selection of them:

I'm glad that Workbench isn't in ROM. I rarely use Workbench, preferring Shell, and my startup-sequence is like *War and Peace*, running various utilities during boot-up. Also, not all RAM expansions auto-configure, and the extra memory has to be added before loading is complete. If the Workbench is in ROM, this isn't possible.

Malcolm Rogers
Rumburgh
Suffolk

When I first read the letter from Gareth Perch in last month's *Amiga Shopper* about the ROM-based Workbench I thought "Hey, there's a nifty idea!" But after some thought on the matter I decided that although feasible, the idea isn't too practical.

My own Workbench disk has been drastically altered so that hardly any of the original programs are still present. I've deleted all the useless waffle, taken the few useful programs from the extras disk and added all sorts of PD utilities such as a cruncher, disk copier and salvaging program as well as the imperative virus busting and boot-block cataloguing devices. I've even done away with the windows and icons of the Workbench screen as I find they take too long to load and take up valuable memory. The disk contains no startup-sequence and kicks me straight into the CLI in a matter of seconds. I find it a perfectly usable environment.

The problem with having a Workbench on ROM is that you can make no alterations to the environment you work with unless a configuration file is read from disk – but even then you couldn't change the programs on the ROMs to suit your own tastes. Upgrades would also be very much more expensive. Bearing these points in mind I prefer the versatility of the disk-based Workbench.

Adrian Chitty
Norbury
London

The technicalities have already been worked out, all that remains is for someone to approach the respective companies for the push into the ROM-based Amiga Workbench software.

I draw your attention to the Action Replay II cartridge from Datel Electronics. OK, so it isn't friendly toward us A590 owners (the missing through-port on the A590 or the Action Replay cartridge, take your pick who is to blame for the omission) but try this: plug in the Replay cartridge and switch the Amiga on. You should get the disk requester screen; now doing a warm reboot (Control-Amiga-Amiga) causes the Datel ROM to boot prior to the Amiga disk requester screen.

This to me means that Datel already has the know-how on cartridge-based software, so all the company should have to do is rebuild the Action Replay cartridge into a modular form providing the following:

- a through-port so I can use my A590 and Action Replay cartridge at the same time
- a ROM slot for the ROM-based software and
- a base unit containing all the interupt electronics.

The mode of operation for the above is simple: you plug in your ROM, switch the computer on, do a warm reboot or initiate the freeze button thereby running the software in ROM instead of Kickstarting and asking for Workbench. Alternatively, you can boot from the disk drive if all you want to do is play games.

Think about it Datel. The big bonus I feel would be that you'd be laying down the guidelines to ROM software producers, and if it's your base unit everyone uses you get to monopolise on ROM slot sales.

Saquib Ghani
Middlesbrough
Cleveland

Three very different opinions there. It's interesting that two of the correspondents forego the Workbench in favour of a good-old-fashioned text prompt. As a long-time PC (and BBC B) user who now works on a Macintosh I miss being able to type commands, and the Amiga seems to offer a nice compromise. Does anyone else out there use the CLI exclusively, and if so, why? And how can the Workbench be improved so the Shell is a forgotten utility? I look forward to your letters.

Dear John...

In this major product roundup, Jeff Walker puts all the main Amiga word processors to the test

THE BASICS

When you are writing, the words have to be the most important thing. A word processor is, after all, supposed to help you write.

Because text editing is basically the meat of a word processor (everything else being the vegetables), all of the packages on test not surprisingly edit text in much the same way – the cursor keys move the insertion point about the document one line or one character at a time, or in larger steps in each direction when used while holding down [Ctrl], [Shift] or [Alt]. All of the programs allow you to position the insertion point and move about the document by using the mouse, if that's what you prefer.

You can cut, copy and paste blocks of text, search for and replace one word or phrase with another, and move freely about and between documents. It is beyond the scope of this article to go into depth about how the text editing facilities of each of the 11 word processors on test actually operate; the important fact is that they all let you edit text as well as a word processor should. In this respect none is better than any other, each is merely different and, once you have got used to the way text is edited, all are easy to use.

OPENING TIME

Likewise, all the word processors except *KindWords* will let you work on more than one document at a time; each document is held in a separate window.

How many you can work on at the same time depends the limitations of the word processor or how much memory you have. Most have upper limits (the number in brackets in the 'multiple documents' section of the features chart on pages 30 and 31), while others are limited only by memory, which isn't always as many documents as you expect. *Excellence!*, for example, complained after I opened only eight empty document windows. With *Personal Write* and *TransWrite*, on the other hand, I lost count of how many new windows I opened.

Wordworth claims to be able to have up to 100 documents open at any one time. I opened 16 empty documents in its default medium-resolution, four-colour mode before it complained about lack of memory. This was on a B2000 with 1Mb of graphics (Chip) memory, which is the type of memory new document windows need.

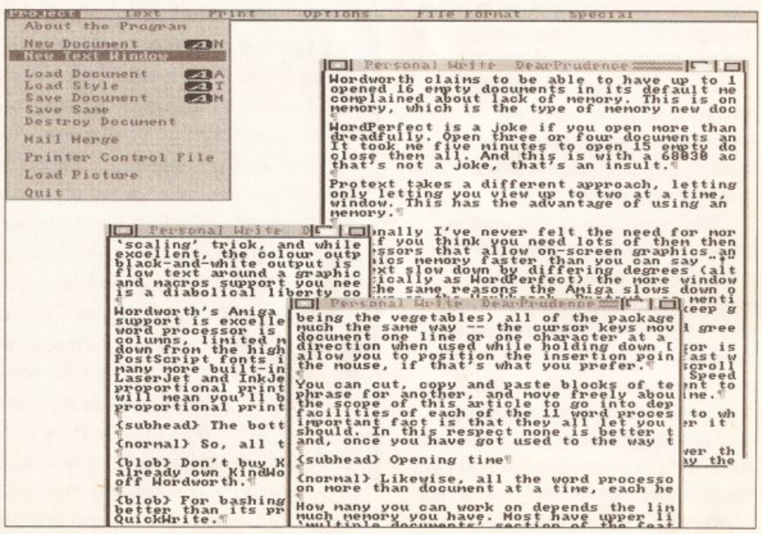
WordPerfect is a joke if you open more than one document, slowing down dreadfully. Open three or four documents and it will bring tears to your eyes. It took me five minutes to open 15 empty documents; it took me 10 minutes to close them all. And this is with a 68030 accelerator fitted. No, I'm wrong, that's not a joke, that's an insult.

Protext takes a different approach, letting you open up to 36 documents but only letting you view up to two at a time, and then only in a single 'split' window. This approach has the advantage that it uses an absolute minimum amount of graphics memory.

continued on page 16



"Testing eleven word processors wasn't easy, but it was certainly interesting. I think that a few common assumptions about which one is best will have to be questioned after this..."
Jeff Walker



Most word processors can open multiple windows – this is *Personal Write*.

BEGINNERS START HERE

Why do you need a word processor? The answer's obvious: to write with.

But why not use a typewriter? Or longhand? Millions of books have been written without the aid of a word processor. Do you really need one?

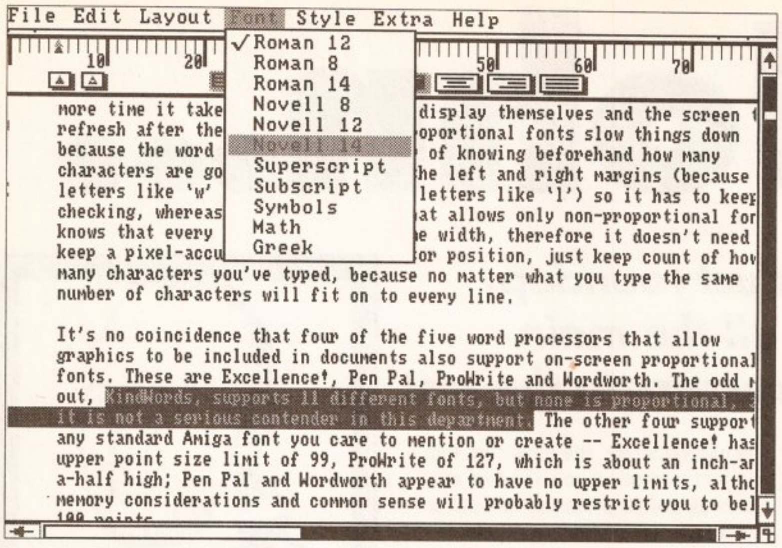
Well, yes, you do. Even if it's only to write letters with. OK, when writing to friends and relations it isn't particularly important to impress, but a stylish, well-presented letter can make the world of difference when writing to the bank manager, for example, or when applying for a job.

Or even when writing to *Amiga Shopper*.

The problem with writing things out longhand or with using a typewriter is that you have to start at the beginning and go on until you get to the end. If, when reading through what you have written, you discover that you've left something out, put something in the wrong place, constructed a paragraph or sentence poorly, spelled a word wrong, gone on for far too long... you have to start all over again and re-write the whole page, or maybe even the whole document. With a word processor you simply load in the file and correct it; so word processors save you time.

They can also improve the quality of your writing. Because you can cut and paste sections of text around a document, you are not forced into presenting what you have written exactly as you typed it in. For example, you can bash out ideas, sentences and paragraphs as fast as they come into your head, go back and expand on them, then move the sections (or 'blocks') into a sensible order. If it doesn't all hang together, you can change something, try out a new idea or mess around until inspiration makes one of its fleeting visits. Sounds disorderly, I know, but this approach is a recognised way of generating new ideas. It's called 'being creative'.

After you've written your piece, you can use the document formatting facilities of the word processor to present and subsequently print out the pages in a professional or eye-catching style. Some word processors allow you to include graphics on the pages, so you can brighten up business reports, for example, with diagrams and graphs.



***KindWords* supports 11 different fonts, but none is proportional.**

continued from page 15

Personally I've never felt the need for more than four documents open at once, but if you think you need lots of them then bear in mind that the word processors which allow on-screen graphics and multiple Amiga fonts all eat up graphics memory faster than you can say "!". And all the word processors except *Protext* slow down by differing degrees (although none anywhere near as drastically as *WordPerfect*) the more windows you have open, in the same way and for the same reasons that the Amiga slows down if you open lots of disk and drawer windows on the Workbench. *Protext*, as mentioned above, doesn't open a new window for every document, so it can keep going at full speed.

VELOCITY BLUES

The 'speed' of a word processor is a difficult thing to judge. Normally if we call a word processor fast we mean that characters appear quickly as we type them and the text scrolls quickly when it wraps and forces everything above to move up one line. Speed can also be judged by how long it takes to move from the top of a document to the bottom, or to move through a document one screenful of text at a time.

All these things are directly related to whether the word processor supports colour and, to a lesser extent, whether it supports on-screen proportional fonts.

The more colours you work in, the slower the text handling will be and the more time it takes for requesters to display themselves and the screen to refresh after they have gone away. Proportional fonts slow things down because the word processor has no way of knowing beforehand how many characters are going to fit between the left and right margins (because letters like 'w' are much wider than letters like 'l') so it has to keep checking, whereas a word processor that allows only non-proportional fonts knows that every character is the same width, therefore it doesn't need to keep a pixel-accurate eye on the cursor position, it just keeps count of how many characters you've typed, because no matter what you type the same number of characters will fit on to every line.

It's no coincidence that four of the five word processors that allow graphics to be included in documents also support on-screen proportional fonts. These are *Excellence!*, *Pen Pal*, *ProWrite* and *Wordworth*. The odd man out, *KindWords*, supports 11 different fonts, but none is proportional, and it is not a serious contender in this department. The other four support any standard Amiga font you care to mention or create – *Excellence!* has an upper point size limit of 99, *ProWrite* of 127, which is about an inch-and-a-half high; *Pen Pal* and *Wordworth* appear to have no upper limits, although memory considerations and common sense will probably restrict you to below 100 points in size.

All four will allow you to mix and match fonts to your heart's delight, up to about 200 or so per document – a limit which isn't a restriction unless you're writing a ransom note.

The other six word processors on test – *Personal Write*, *Protext*, *QuickWrite*, *Scribble!*, *TransWrite* and *WordPerfect* – all employ whatever is the default font (usually topaz8) and no other, and hence operate more quickly. We're back to swings and roundabouts again – do you want fancy Amiga fonts on-screen and in your output, or do you want to simply bash out words, using your printer's built-in font or fonts for the output, or perhaps import the text into a desktop publishing program?

BETTER OUT THAN IN

Your decision as to which word processor to buy will be influenced by the type of printer you have.

If your printer has a number of built-in fonts, then you will want the word processor to use them; if it only has one or two boring draft and NLQ fonts, then you'll want the word processor to send the Amiga fonts to the printer, using the highest resolution possible for more professional-looking results.

Obviously, the six packages that do not support multiple fonts can only output text in the printer's built-in fonts, or a font that has been 'downloaded' to the printer by another program. The normal text styles of bold, italic and underline are available of course, but even a seemingly simple job like changing the pitch mid-document from 10 characters per inch (pica) to 12 characters per inch (elite) can be an awkward job if you don't understand how to use the word processor to send printer control commands.

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GET EQUIPPED

If you are going to spend a serious amount of time word processing then you will need more than just the standard Amiga 500. While your computer will work happily with the spare TV, sitting up close staring at that poor-quality screen for hours on end is going to end in tears. Not tears of frustration, tears of pain. You will eventually begin to suffer headaches. You need a good monitor, something like the Commodore 1084 or the Philips CM8833.

If you want to print out your documents, then you need a printer. Do not rush in to this decision. On no account buy any printer – including that second-hand 'bargain' from the bloke down the pub – until you know for certain that there is an Amiga printer driver for it. How do you find this out? Simple. Ask to see it working on an Amiga. Make sure that it prints text and graphics without any spurious characters appearing in the output. If the person selling you the printer can't make it work properly, don't assume that they are stupid, assume that the printer doesn't work. By all means make further enquiries (write to *Amiga Shopper*, for example), but don't part with your money until you have seen that it works.

And make sure that the quality of output is up to the standard you need. Don't be fobbed off with the excuse that the printer is capable of far higher-quality output than the person selling the printer can demonstrate because he or she is inexperienced with the Amiga. If you must buy blind, then look for the words 'Epson compatible'. This guarantees that the Amiga can drive it.

Something else to bear in mind is that 9-pin printers can output graphics dumps (pictures from a paint program, for example) better than 24-pin printers. Until they change the way all 24-pin printers work, don't let anybody tell you different. But 24-pin printers, of course, output higher quality text. It's swings and roundabouts.

If you need high-quality graphics and high-quality text, then you'll need to consider an inkjet or bubblejet printer. If you want very high quality output, then it has to be a laser printer.

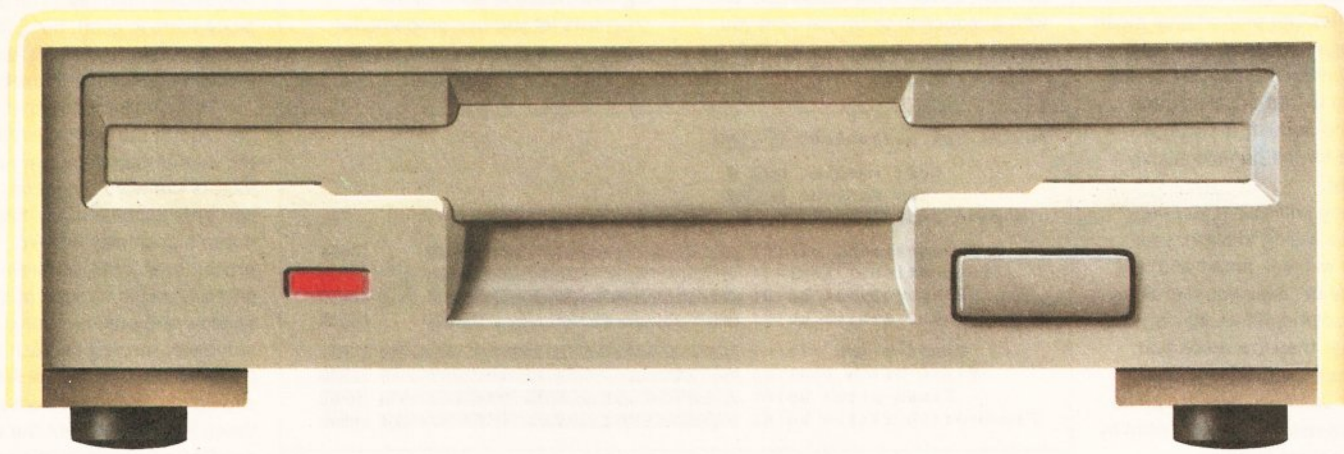
Just as important as a good monitor and adequate printer is a second floppy disk drive. Even if the word processing system you choose can run off one disk – and some can't – you will want to save your documents on to a separate disk. With a single-drive system you will be forever swapping disks, which can lead quickly to 'diskswap finger'. The symptoms are a permanently bent index finger with a bulbous hard pad at the tip, and intense annoyance on the part of the operator.

Most important for Amiga 500 owners is extra memory. Although some Amiga word processors will work with only 512K, after they have loaded they will leave precious little room in memory for your document. Spelling checkers? Forget it, unless the spelling checker is a separate program.

At the very least you must buy yourself a 512K memory expansion that fits in the trap door underneath the Amiga. However, I would recommend that you invest in a larger expansion board from the word go. If you don't want to open up your Amiga to fit a large board, then go for one that slots on to the expansion bus on the left-hand side of the computer.

If you're really serious about your word processing and you've got some savings put by, you can kill the last two birds (disk storage and memory) with one stone by purchasing a hard drive that allows RAM chips to be fitted inside it.

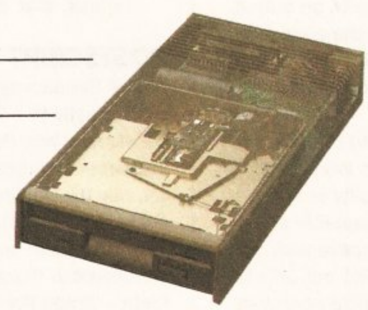
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That's assuming, of course, that the word processor is capable of sending printer control commands. In fact, only four of them can – *Personal Write*, *Protext*, *Scribble!* and *WordPerfect*. By using one technique or another to embed printer control codes into the text, these four word processors can make the printer do anything it is capable of doing – change fonts mid-document (even mid-sentence) for special emphasis, flip the printer into proportional mode and back again, use any character in any of the printer's character sets… the problem is that printer control codes are notoriously difficult to understand for the non-technically-minded user.

But if you know what you are doing, or are willing to learn, your documents will look smart and professional because you are using the high resolution fonts inside your printer rather than low resolution Amiga screen fonts. The *Protext* manual, for example, was produced from camera-ready artwork printed by *Protext* on a laser printer.

With *QuickWrite* and *TransWrite* you are restricted to a single printer font per document, but bold, italics and underline can be employed to brighten up the pages.

The five word processors that support multiple fonts – *Excellence!*, *KindWords*, *Pen Pal*, *ProWrite* and *Wordworth* – can all be forced to used printer fonts instead, but only one of them per print run; in other words, you can't change fonts in the middle of a page. If multiple font documents are what you want then you will have to use Amiga fonts on-screen and choose the word processor's 'graphics' output mode. All except *KindWords* use the standard Amiga preferences printer drivers – if your printer isn't supported by *KindWords* (ask before you buy!) you are restricted to draft and NLQ output using a single printer font, like *QuickWrite* and *TransWrite*.

The printed output from Amiga screen fonts ranges from awful to fairly good, depending on which package you use. *Pen Pal*'s output is awful because it basically does a screen dump of what you've got on-screen, which is at a resolution of about 75 dots per inch. The same goes for *Excellence!* and *KindWords* (despite the so-called 'SuperFonts' and 'SuperDrivers' it comes with).

ProWrite has a trick up its sleeve to increase the output quality of Amiga screen fonts – by 'reducing' the page you can effectively increase the font resolution. Reducing by 50 per cent doubles the resolution, and with a reduction to 25 per cent you can get output fairly close to 300 dots per inch – provided your printer is capable of such a feat, of course.

ProWrite achieves this higher output resolution by increasing the page width on-screen and then scaling it down again when sending it to the printer. To get high-quality 12pt output you would use a 48pt font on-screen and reduce to 25 per cent for output.

Wordworth uses a different trick to achieve similar results on output. Instead of increasing the page size and scaling it down, *Wordworth* loads a larger font into memory and scales that down.

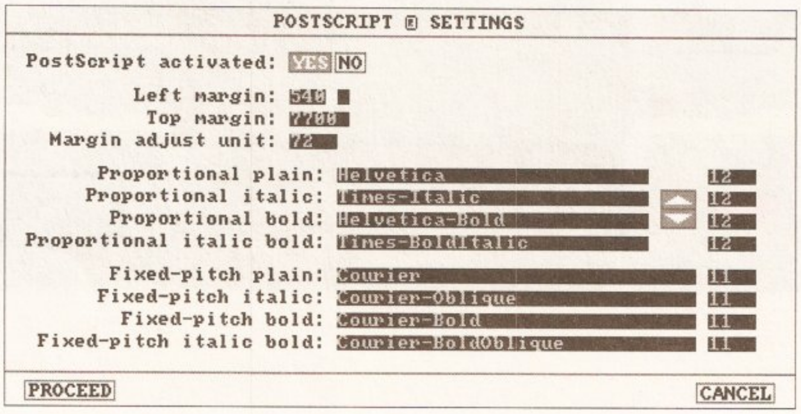
There's not a lot to choose between *ProWrite* and *Wordworth* with regard to the quality of this output – both are acceptable and streets better than *Excellence!*, *KindWords* and *Pen Pal*, but until the new version of the Amiga operating system is released (which supports scaleable fonts), both depend upon you having a supply of fonts in large sizes. *Wordworth* comes with four, *ProWrite* with none.

Wordworth, *Pen Pal*, *Excellence!* and *ProWrite* have another trick up their respective sleeves in the attempt to achieve better quality output – these four will allow you to output a document which includes graphics using the a printer font for the text instead of an Amiga screen font, which *KindWords* insists on if the document has a picture in it.

None of the packages does this particularly well. *Wordworth* makes you put the paper through the printer twice, unless the printer can reverse line feed, which most can't; *Pen Pal* doesn't always get its standoff distances correct, so text sometimes ends up running over part of a graphic; *Excellence!* needs much messing about with to get the output to look as it does on screen; *ProWrite* I don't know about, the manual says it can do this neat trick but all I ever managed to get out of the printer was garbage, form feeds and lots of beeps. However, it's no big deal because none of the programs let you use proportional printer fonts (yet), so the output always looks a little amateurish whichever package you use.

Talking of proportional printer fonts, none of the five multiple-font word processors can use them, even with no graphic in the document. Sounds stupid? Darn right it does! If you want to use your printer's proportional fonts, *Personal Write*, *Protext*, *Scribble!* or *WordPerfect* are your choices.

Unless, that is, you have…



***Personal Write* allows you to mix four PostScript fonts in one document.**

POSTSCRIPT

Two of the packages on test can print directly to a PostScript device: *Excellence!* and *Personal Write*. *ProWrite* can support PostScript if you buy the additional *ProScript* package (£39.95).

Excellence! comes with four correct-width 'PostScript' screen fonts – Times Roman, Helvetica, Courier and Symbol – in point sizes of 8, 12, 16 and 24. That's the lot. Better than nothing, but only just. Output can be sent to disk so you can trot down the road and get it output on the local print shop's typesetting machine.

Personal Write doesn't come with any screen fonts, because it doesn't work that way. It is possible to mix four different PostScript fonts in one document, one each for Proportional plain, italic, bold and bold italic, or one each for the same flavours of fixed-pitch (non-proportional), which defaults to Courier, the only fixed-width font which comes as standard with all PostScript devices. *Personal Write* knows about 32 of the 'classic 35' fonts, which can be toggled between, or you can enter names directly into string gadgets. Each font can be in a different point size, up to 9,999pt.

Incredibly, *Personal Write* cannot save PostScript output to disk; you have to go about it indirectly by using the Amiga's CMD command.

DRIVE YOUR PRINTER

On the whole, the standard of the text editing features of all the word processors is good, but getting high-quality output is difficult, slow, memory consuming or expensive.

Some might argue that this is the fault of the Amiga, or the fault of the printer manufacturer, not the fault of the word processor. But if a printer is capable of printing in half-a-dozen high-quality built-in proportional fonts, in three different pitches, and in a range of styles like shadow and outline, then a word processor running on such a powerful machine as the Amiga should be able to take advantage of these features without the user needing a Computer Science degree.

Because of its easy-to-change printer drivers, only *Protext* comes close. *Protext* doesn't use the standard preferences printer drivers, it uses a type of its own invention. These are initially ordinary *Protext* text files, which get automatically 'compiled' when used for the first time. Currently *Protext* knows about 80 or so types of printer, and this number grows by the month. If you have an obscure printer which isn't supported, provided you have a manual for it and understand printer control codes, changing an existing driver is not at all difficult. You can even 'program' new entries into *Protext*'s Style menu. A separate manual shows you how. Novices may take one look and run for cover, but Arnor deserves recognition for applying itself to a problem every other Amiga word processor developer (to date) has ignored.

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THE RATINGS

This review looks at the different things which you would expect from word processors, and rates each program for each of these things.

The ratings are on a scale of 1-5, with a rating of 1 meaning 'Poor', 3 'Average' and 5 'Excellent'.

CHECKOUT
BASIC TEXT FEATURES

Excellence!	●●●○○
KindWords	●●○○○
Pen Pal	●●○○○
Personal Write	●●●○○
Protext	●●●●●
ProWrite	●●●●○
QuickWrite	●●○○○
Scribble!	●●●○○
TransWrite	●●●○○
WordPerfect	●●●○○
Wordworth	●●●●○

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Deluxe Paint (3)....£59.99
Director (2)....£79.99
Disney Animation Studio....£79.99
Fantavision....£29.99
Icon Paint....£14.99
Imagine 3D....£174.99
Photon Paint....£19.99
Pixmate....£39.99
Professional Draw (2)....£99.99
Real Things - Birds 1 & 2....£23.99
Real Things - Humans....£23.99
Real Things - Horses....£19.99
Spectra Colour....£54.99
The Art Department....£54.99
X-Cad Designer....£89.99

Podscat 12 x 12 Tablet....£179.99
Podscat Drivers....£22.99

Colourburst Tablet....£519.99
Pandaal Hand Scanner....£159.99
JX100 Scanner....£579.99
Scanlab Software for above....£69.99

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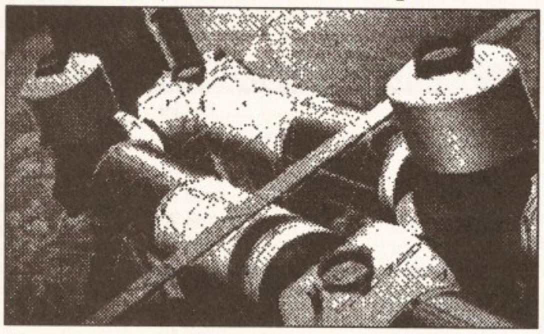
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PostScript Output at 300 dpi



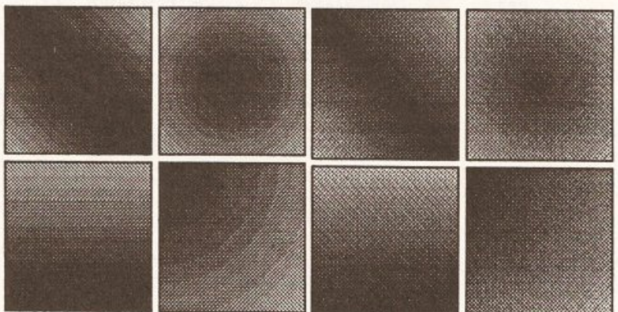
When pixel values cannot be reproduced exactly, **PostScript** renders the affected pixels in the closest *darker shade* available at the given screen density. *Subtle details are inevitably lost as a result.* PostScript halftones also tend to have a grainy appearance because of PostScript's inability to produce irregularly shaped halftone cells.

SaxonScript Output at 300 dpi



Because SaxonScript's algorithms intelligently switch between *halftoning* and *dithering,* any pixel value can be accurately reproduced. Notice the greater detail found in this image. *SaxonScript's* images are also sharper and crisper than comparable PostScript images because of the program's unique ability to create **irregular halftone cells.**

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- Support for **all** *Postscript downloadable fonts* including **Compugraphic, Adobe Type 1** and **Adobe Type 3** fonts obtained from any number of different sources. *Any* PostScript font on an Amiga disk can be manipulated within ***SaxonScript Professional.***
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- The ability to convert PostScript files into a **compressed PostScript format** for faster output at service bureaus.
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- The conversion of PostScript files into **IFF, EPS, EPSF,** or **DR2D** formats for editing and manipulations in various applications.
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FORMATTING

Formatting is all about preparing a document to be printed. Presentation, as they say, is nine-tenths of the sale.

In effect, when you are formatting a document you are 'typesetting' it, although this is far too grand a word to describe the relatively simple facilities most word processors give you to define the way the words (and, these days, pictures) should be output to the printed page.

The majority of a word processor's formatting features revolve around, or should that be along, the 'ruler'. In most packages the ruler appears along the top of the screen, looking much like a physical ruler, graduated in inches or centimetres or some other specified measurement system. The ruler is where margins and tab stops are specified.

In a good word processor each paragraph can have its own ruler, allowing for maximum layout flexibility – the desire to indent some paragraphs more than others is a simple example, a more complicated example would be a table of words and figures with lots of tab stops.

To have to set up this ruler every time you wanted a similar table in your document would be a pain, so paragraph formats must be able to be duplicated.

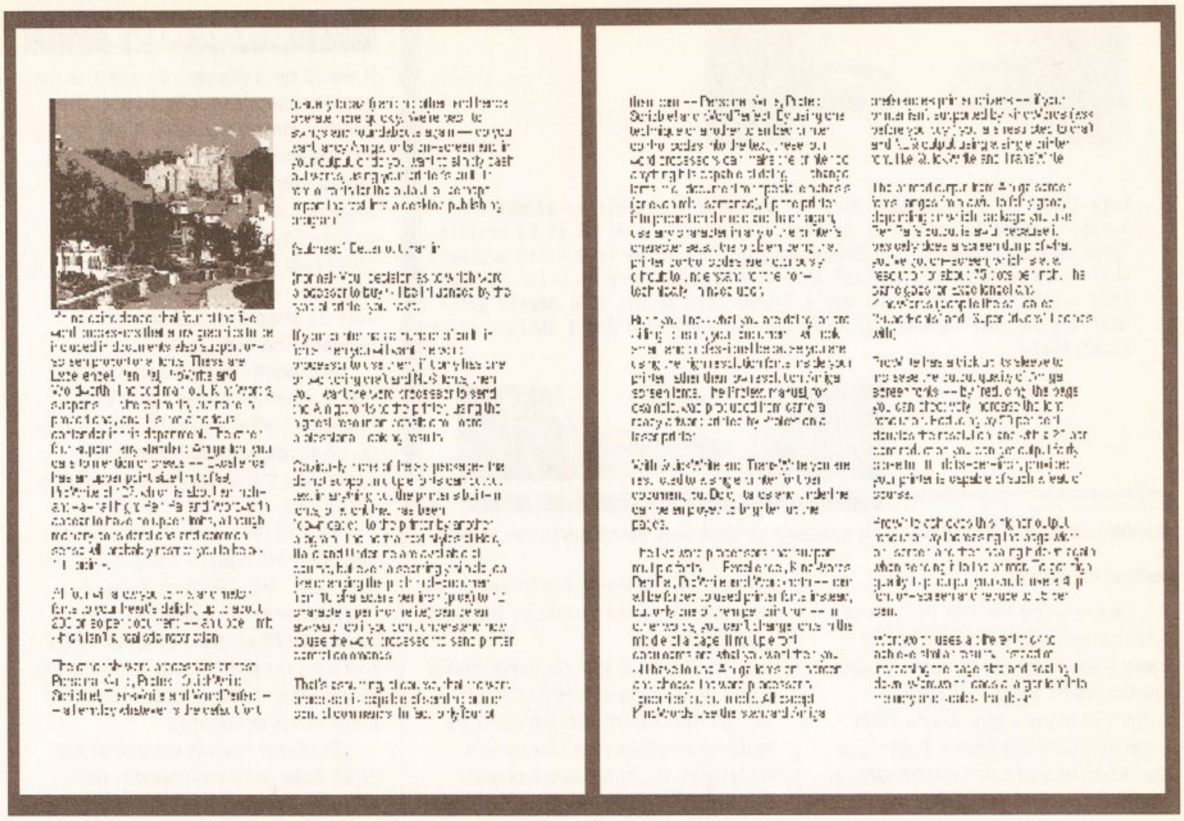
There are other important formatting considerations, and we'll come on to these, but the ruler is the main tool of the trade.

WORK TO RULE

Four of the word processors on test don't have rulers – *Personal Write*, *Scribble!*, *TransWrite* and *WordPerfect*. This doesn't make them poor programs, but it does hint that their main job in life is to allow writers to bash out words.

Scribble!, *TransWrite* and *Personal Write* have some simple document formatting facilities, enough to get decent hard copy, but nothing you could prepare (say) an impressive report with. Gold Disk's *TransWrite*, of course, was designed to integrate with the *Professional Page* desktop publishing program, so it has a good excuse.

WordPerfect has a large number of formatting features, but they are chosen from menus and requesters – or by pressing a sequence of keys – one at a time, making formatting a page, or even a paragraph, a nightmare at times. This is how it used to be done in the days when computers were something only rich companies owned, and when secretaries were sent on long courses just to learn how to use word processors.



A document's layout can be improved if the text flows over more than one column – this is *Excellence!*'s print preview.

All of the remaining seven word processors have rulers; *QuickWrite* and *Pen Pal* have no facilities for copying and pasting a ruler or paragraph format, while the rest have multiple rulers.

UP AND DOWN

The layout of certain types of document can be improved by having more than one column of text on the page. Multiple columns are really the domain of desktop publishing, but four of the word processors on test have a certain amount of support for columnar layouts.

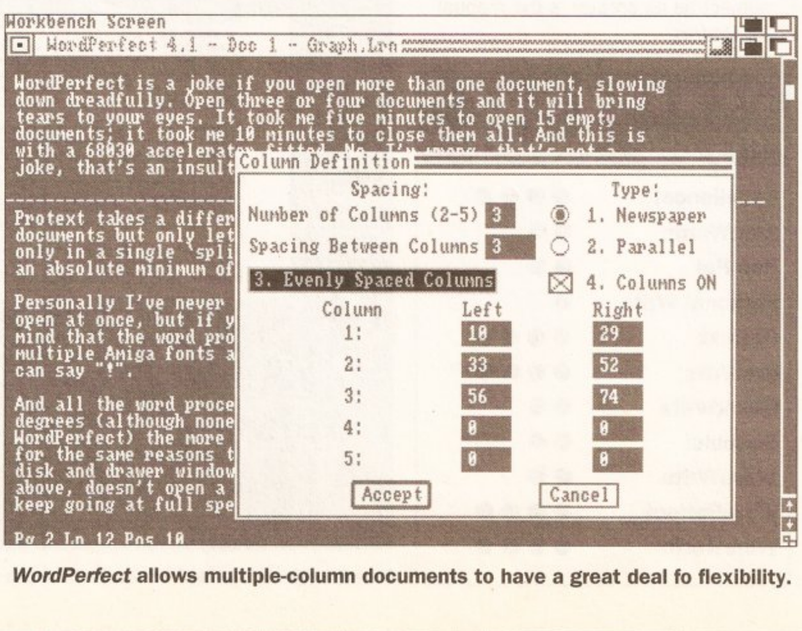
ProWrite gives the most flexible support. You can have up to five columns across a page, with a specified gap between each, and the columns can be either snaking (newspaper style, where the text flows all the way down the first column and wraps to the top of the second column, and so on) or parallel, where paragraphs are positioned side by side across the page instead of one under the other. Column breaks can be inserted to force the cursor to the top of the next column before it has reached the bottom of the current one.

WordPerfect also allows up to five snaking or parallel columns, but they are a little cumbersome to set up and there is no way to break columns. *Excellence!* supports up to four snaking columns, again with no column breaks.

These three provide an on-screen columnar display which you can freely edit and move around just as if the text was in one wide column, and they are you only real choices if quick-and-easy multiple columns is what you're after. *Protext* can do columns, but only by cutting and pasting boxes of text next to each other after you've finished writing or editing. Spot a mistake and you'll be able to edit it, but deleting a character will drag everything to the right of that character across to the left one space, including the line in the column to the right, so you have to go and insert a space to correct it. And you can only use your printer's non-proportional font, otherwise the columns will not print out as columns but as a ragged mess.

The advantage of this method is that you can cut and paste any chunk of text to anywhere on the page. For instance, you can have as many columns as is sensible with your page width or character pitch, or you could cut a long thin column out of a price list and paste it into another document. *Protext*'s 'box' mode takes a little getting used to, but it's something that none of the other programs can do.

If multiple columns are important to you, think carefully before buying a word processor with this facility – would an inexpensive black-and-white desktop publishing program like *PageSetter II* suit your needs better?

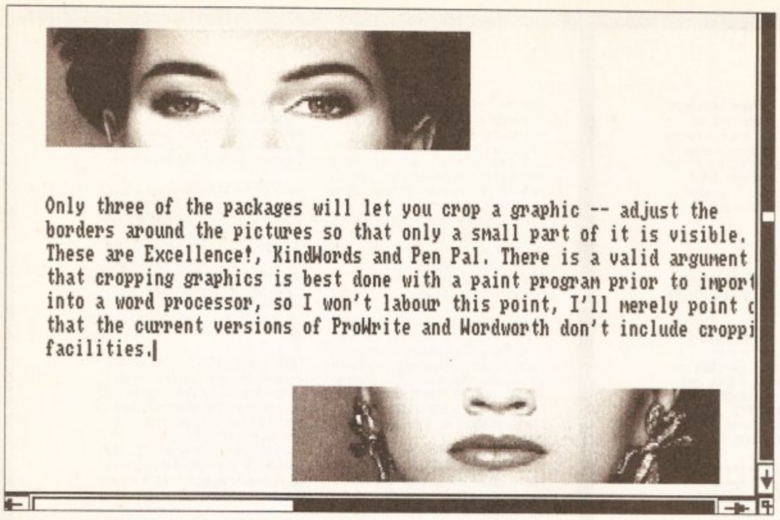


***WordPerfect* allows multiple-column documents to have a great deal fo flexibility.**

TOP AND TAIL

There are number of small things that makes large documents look professional; things like headers, footers, footnotes and endnotes.

continued on page 22



***KindWords* allows graphics to be cropped so that only small parts are visible.**

continued from page 21

Headers are the line or lines of text that get printed on the top of every page of the document; footers are the same thing, but at the bottom of every page, where most page numbers are found. Footnotes are those bits of extra information in smaller type that you get at the bottom of the page in technical and reference books; somewhere in the text is a small number sitting on the end of a word or sentence, raised slightly (superscript), and this corresponds to the note at the foot of the page. Endnotes are the same thing, only the notes are collected together at the end of a chapter or complete document.

All the packages on test can handle headers and footers with a deal of flexibility, except *Personal Write* which only allows a one-line header and a page number in either the top or bottom margin.

Excellence! is the only one of the 'graphics' word processors that can automatically insert footnotes; *Protext* and *WordPerfect* can do footnotes and endnotes by inserting special commands into the text at relevant points.

All 11 packages can automatically number the pages of your document – all can do Arabic numerals (1, 2, 3 and so on), some can do Roman as well (i, ii, iii...), and some alphabetical (a,b,c ... aa,ab,ac...). See the features chart for what does what. And if your document is going to be produced as a book or pamphlet it may be important to have different odd-page and even-page margins and headers, a feature known as 'facing pages' by most word processors. Again, some can do it, some can't. See the features chart.

WP OR DTP?

On the whole you can format a neat enough document with any of these word processors. It's harder work with some than others, but in my experience the ones that force you to work harder tend to produce the best end results.

Wordworth is getting dangerously close to desktop publishing, even though the current version can't do multiple columns (the company's working on it). Why 'dangerously'? Because if it goes much further down this road, and I know that Digita has big plans, it might have to be assessed in relation to its new market competitors – *Professional Page*, *PageStream* and *Saxon Publisher* – and instead of being a good word processor it may end up in a 'Poor DTP' pigeon-hole.

As a final observation on the subject of document formatting, I notice that the *Scribble!* manual admits to being produced with *Excellence!* (both packages are by MSS) and the *Excellence!* manual looks like it may well have been produced by the same program, but doesn't specifically admit to it. Similarly, the *QuickWrite* and *ProWrite* manuals look like they were produced with *ProWrite* (both from New Horizons), but don't actually say so. The only manual confident enough to own up to using its subject as its creator is the manual for *Protext*.

CHECKOUT
DOCUMENT FORMATTING

Excellence!	●●●●○
KindWords	●●○○○
Pen Pal	●●○○○
Personal Write	●○○○○
Protext	●●●●○
ProWrite	●●●●○
QuickWrite	●●○○○
Scribble!	●●○○○
TransWrite	●●○○○
WordPerfect	●●●●○
Wordworth	●●●●○

GRAPHICS

It would be a mistake to assume that one word processor is 'better' than another simply because it will let you include graphics in your documents. Laying out text and graphics on a page is the job of desktop publishing, and the minute a word processor lets graphics in the door it stops being a word processor and sets up shop in a halfway house between the two.

The point I'm trying to make is that a graphics capability is only useful if it allows you the freedom to do what you want to do without sacrificing the quality or appearance of the text.

Four of the word processors on test here will have nothing to do with graphics – *WordPerfect*, *Protext*, *TransWrite* and *QuickWrite*. Two of them, *Scribble!* and *Personal Write*, half support graphics by allowing you to load and dump a picture at some point in the document.

Scribble! does it via one of its embedded 'dot' commands, and gives you control over the left margin position and the width, height and printer density of the graphic dump. Your document would contain this 'dot' command at the point in the text where you would like the picture to appear; it's up to you to make sure that there is enough room left on the page for the picture. Naturally, you cannot run text around the pictures, only above and below them.

Personal Write's method is weird and cumbersome, and the program would probably come across as a better one if the facility had been left out. You load a graphic into a separate window, after which you can drag the graphic to the left and right with the mouse. The graphic gets re-mapped to eight colours, colour 0 becomes a transparent background. When you are happy with its position you can dump it to the printer. Not in the middle of a document, mind you, only at the start or the end of it, either before or after you print the text. It seems a fairly useless feature to me, although I suppose it could be employed to create and print out a personal or company logo at the head of a letter.

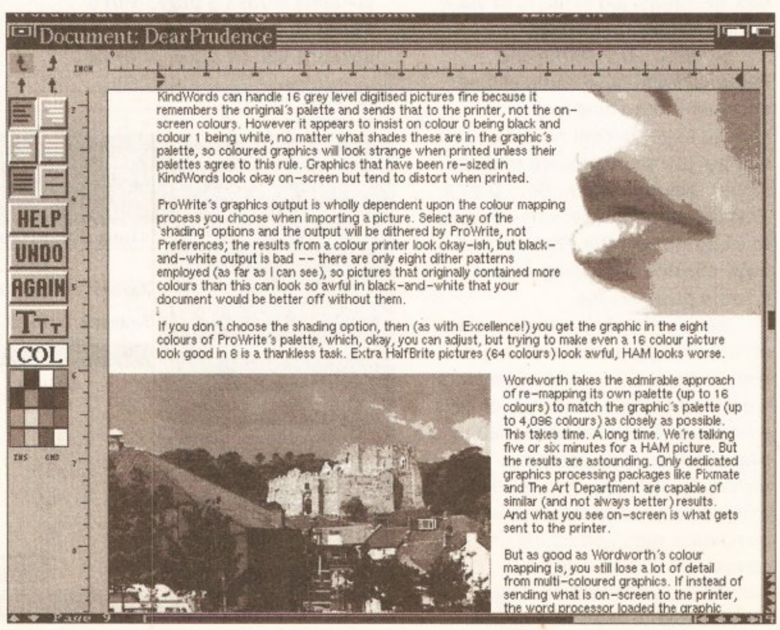
The real graphics fun starts with the 'Fancy Five' – *KindWords*, *Excellence!*, *ProWrite*, *Pen Pal* and *Wordworth*.

IMPORT AND DISPLAY

I was shocked to discover that *Excellence!* has the lowest graphics import-and-display specification. It can load IFF graphics of up to 32 colours, but it converts these to a maximum of eight colours, using the current *Excellence!* palette settings. Unless the graphic was created in eight or less colours using the same palette, be prepared for some sick-looking pictures, or you'll need to spend some considerable time messing about with the palette trying to make them better.

KindWords also loads up to 32-colour graphics. It converts them to a maximum of 16 colours and displays them in its own (unchangeable) palette, which looks seriously psychedelic. However, *KindWords* remembers up to 16 colours of the original palette and can display the picture in these hues if you ask.

Wordworth, *ProWrite* and *Pen Pal* can import everything up to HAM (4,096 colours). *Wordworth* converts to a maximum of 16 colours, and can change colours 4-15 of its own palette to match as closely as possible those of the original graphic. *ProWrite* converts to eight colours, but can use colour dithering to create the illusion of more; alternatively it can convert a colour



***Wordworth* allows text to run around the right or left of graphics.**

graphic into a monochrome (black-and-white) dither pattern.

Pen Pal is a special case. It converts a graphic to eight colours for on-screen representation only, then for printer output it uses the graphic's original palette – all 4,096 colours (or grey levels for black-and-white printers, of course) if it is a HAM picture.

Pen Pal and *ProWrite* are the only word processors that will let you 'hide' the graphics once they have been positioned, allowing for faster screen refresh when word processing. *Pen Pal* is the only one that has a grid to which graphics can be 'snapped', allowing for greater positioning accuracy, and it's the only one that gives you some simple drawing tools for creating straight lines and boxes.

SCALING AND CROPPING

All of the Fancy Five will let you re-size graphics on-screen, either preserving or ignoring the original aspect ratio. All take a short while to calculate the changes.

Pen Pal stands out again. It holds two copies of the graphic in memory; one copy is displayed on-screen, which you may or may not have re-sized, the other copy is a duplicate of the original full-sized graphic, held in memory so that when you re-size it the calculations are performed on the original, not the on-screen representation. In practice this means that you can make a graphic very small and then change your mind and enlarge it again without the graphic turning into a blocky mess, which is what happens if you do the same thing with the other four, forcing you to re-load the graphic and start again.

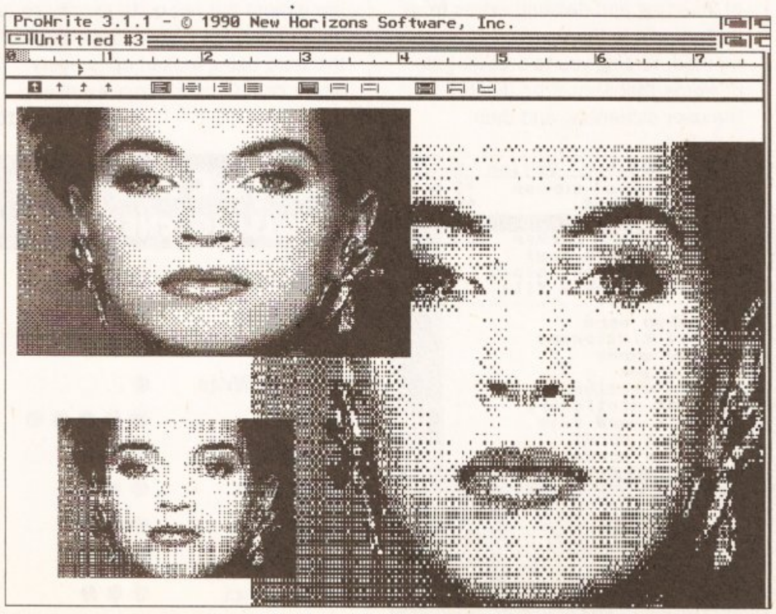
I was heartbroken to find that *ProWrite*, which employs dither patterns to represent the colours of a graphic, simply enlarges or reduces the on-screen pattern rather than recalculating the dither. Re-sizing larger results in bigger dots (as opposed to more dots), re-sizing smaller corrupts the graphic with a banding effect.

Only three of the packages will let you crop a graphic – that is, adjust the borders around the pictures so that only a small part of it is visible. These are *Excellence!*, *KindWords* and *Pen Pal*. There is a valid argument that cropping graphics is best done with a paint program prior to importing into a word processor, so I won't labour this point, I'll merely point out that the current versions of *ProWrite* and *Wordworth* don't include cropping facilities.

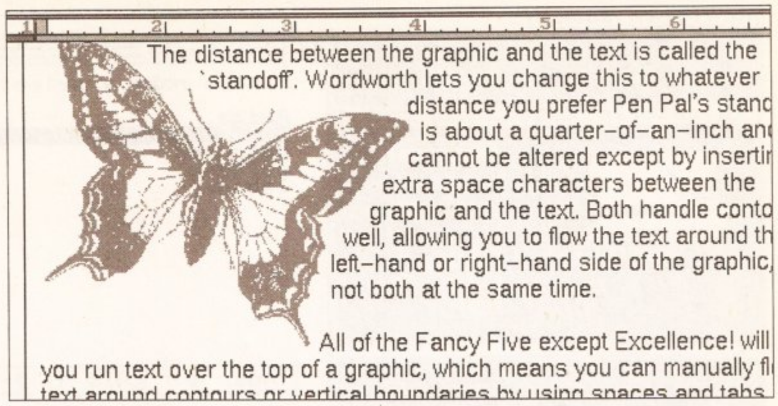
GO WITH THE FLOW

The odds are that if you are importing a graphic into a document you will want to run text around it, either straight down one side with a vertical boundary or, if it is an irregularly shaped object, around the contours of that object. You won't want to do this by hand; if you move or re-size the graphic you will want the text to adjust itself automatically. This feature is called 'text flow' and, unbelievably, only two of the Fancy Five fully support it – *Wordworth* and *Pen Pal*.

The distance between the graphic and the text is called the 'standoff'. *Wordworth* lets you change this to whatever distance you prefer, while *Pen Pal*'s standoff is about a quarter-of-an-inch and cannot be altered except by inserting extra space characters between the graphic and the text. Both handle contours well, allowing you to flow the text around the left-hand or right-hand side of the graphic, but not both at the same time.



***ProWrite* doesn't re-calculate the dither pattern when enlarging or reducing a graphic – which can lead to a serious degradation in the image quality.**



***Pen Pal* has a fixed distance for runaround text of about 0.25 inches.**

All of the Fancy Five except *Excellence!* will let you run text over the top of a graphic, which means that you can manually flow text around contours or vertical boundaries by using spaces and tabs if you need to.

ON THE PAGE

Because of the different ways graphics are imported and converted for inclusion in the document, each of the packages outputs graphics to the printer differently.

Excellence! re-maps the imported graphic to its own 8-colour palette, which you can change, and sends the exact colours (or grey level representations) you see on-screen to the printer. In practice this means that you are restricted to 2, 4 or 8-colour graphics, even though *Excellence!* can import up to 32 – the printed output from a 16 or 32 grey-level digitised picture, for example, is poor; black-and-white and clip art, on the other hand, is good.

KindWords can handle 16 grey-level digitised pictures fine because it remembers the original's palette and sends that to the printer, not the on-screen colours. However, it appears to insist on colour 0 being black and colour 1 being white no matter what shades these are in the graphic's palette, so coloured graphics will look rather strange when printed out unless their palettes agree to this rule. Graphics that have been re-sized in *KindWords* look OK on-screen but tend to distort when printed.

ProWrite's graphics output is wholly dependent on the colour mapping process you choose when importing a picture. Select any of the 'shading' options and the output will be dithered by *ProWrite*, not Preferences; the results from a colour printer look OK-ish, but black-and-white output is bad – there are only eight dither patterns employed (as far as I can see), so pictures that originally contained more colours than this can look so awful in black-and-white that your document would have been far better off if you hadn't included them.

If you don't choose the shading option, then (as with *Excellence!*) you get the graphic in the eight colours of *ProWrite*'s palette which, true, you can adjust, but trying to make even a 16-colour picture look good in eight is a thankless task. Extra HalfBrite pictures (64 colours) look awful, HAM looks worse.

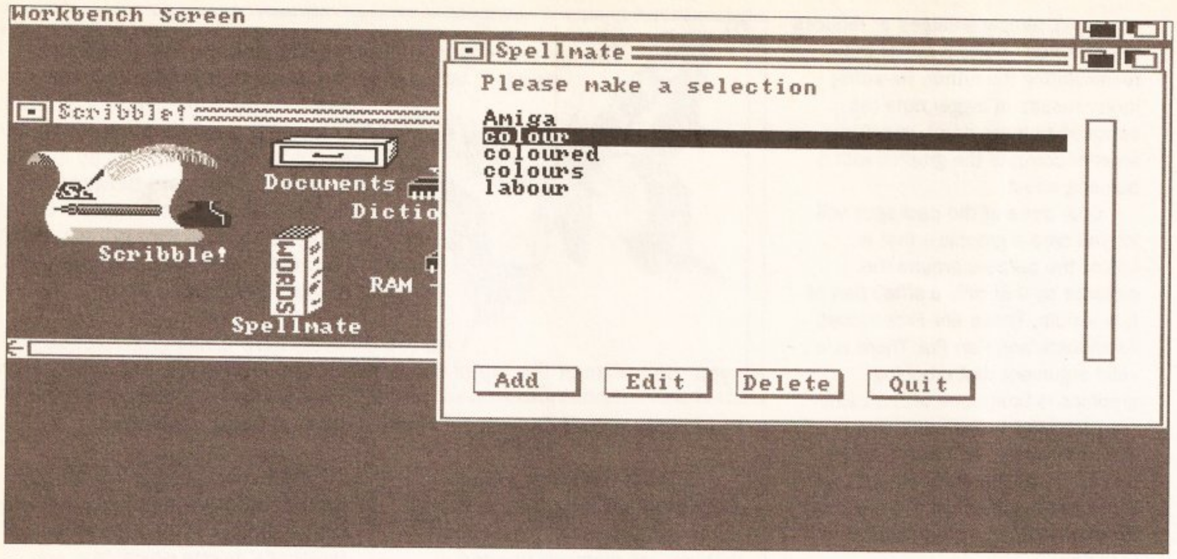
Wordworth takes the admirable approach of re-mapping its own palette (up to 16 colours) to match the graphic's palette (up to 4,096 colours) as closely as possible. This takes time. A long time. We're talking five or six minutes for a HAM picture. But the results are astounding. Only dedicated graphics processing packages like *Pixmate* and *The Art Department* are capable of similar (and not always better) results. And what you see on-screen is what gets sent to the printer.

However, as good as *Wordworth*'s colour mapping is, you still lose a lot of detail from multi-coloured graphics. If, instead of sending what is on-screen to the printer, the word processor loaded the graphic from disk and printed that – positioned, re-sized and cropped as specified – you wouldn't lose any detail. This is what *Pen Pal* does: it converts a graphic to eight colours for on-screen display, but when it outputs it prints the original file, not what you see on the screen.

continued on page 24

CHECKOUT
GRAPHICS

Excellence!	●●○○○
KindWords	●●○○○
Pen Pal	●●●●○
Personal Write	N/A
Protext	N/A
ProWrite	●●○○○
QuickWrite	N/A
Scribble!	N/A
TransWrite	N/A
WordPerfect	N/A
Wordworth	●●●●○



***Scribble!* comes with a separate utility for dictionary management, so you can correct mistakes.**

continued from page 23

SPELLING CHECKERS

Only one of the packages on test, *Personal Write*, comes without a spelling checker – but then it's the cheapest of the bunch, so this is understandable.

The rest are all supplied with big dictionaries and all have options to create your own 'user' dictionaries of words the supplied ones don't know about. All the spelling checkers work in much the same way, at much the same speed, which is fairly quickly if you're running from a hard disk or you copy the dictionaries into RAM, or very slowly if you store the dictionary on a floppy disk.

It should be noted that even with 1Mb of memory you may not have enough left after loading the program and your document to copy the dictionaries into RAM.

ALL AT ONCE

Another way to speed up spelling checking is to do it as a 'batch'. This means that the whole document is analysed, and then the spelling checker asks you what to do about all the unknown words it discovered.

The advantage here is that if you've spelt a word wrongly five or six times, correcting it once will correct every occurrence in the document. Only *Protext* and *TransWrite* have a batch spelling check mode. *TransWrite*'s is a little awkward to use; you're never quite sure whether you've clicked the correct button or done the right thing. In fact, on the whole *TransWrite*'s spelling checker is the unfriendliest of the lot – but then, you can't expect the world for £40.

Protext's batch mode is by far the quickest and easiest way to check spelling – there's no annoying requester popping up every few seconds, and no wait while the screen gets its act together so it can highlight the word under examination. In batch mode, *Protext* simply goes through the whole document, afterwards presenting you with the unknown words, one at a time in alphabetical order. If, though, you like checking the spelling the other way, which often means having to correct the same misspelt word more than once, *Protext* will quite happily let you.

ROLL YOUR OWN

Protext is also unique in that it allows up to six dictionaries to be checked for correct spellings. Four are provided by Arnor – the two main ones, plus two 'quick' dictionaries of common words. The other two can be supplied by yourself as user dictionaries.

Any or all of these dictionaries can be used automatically to look up words when checking the spelling of a document, which means that you could configure *Protext* to check nothing but one of the quick dictionaries, which would save enormously on memory and time, or to check all of them, which would use more memory and take longer, but would throw out less words as being spelt incorrectly.

You can build as many dictionaries as you like, specialised ones for specialised documents for example, and have different 'config' files (what the rest of the world calls 'preferences' files) that specify which dictionaries to use.

TransWrite also lets you load and use other user dictionaries by specifying the filenames in the spelling checker program's Tool Types. The only other program to speed up things by looking in a 'quick' dictionary of common words first is *Pen Pal*.

All the word processors that have spelling checkers provide the means to create at least one user dictionary, and each has its own way of inserting and deleting words from it. *Protext*'s is the most cumbersome method, forcing you to create a file of words that should be deleted from the user dictionary, and then providing its Delete Words option with the name of that file.

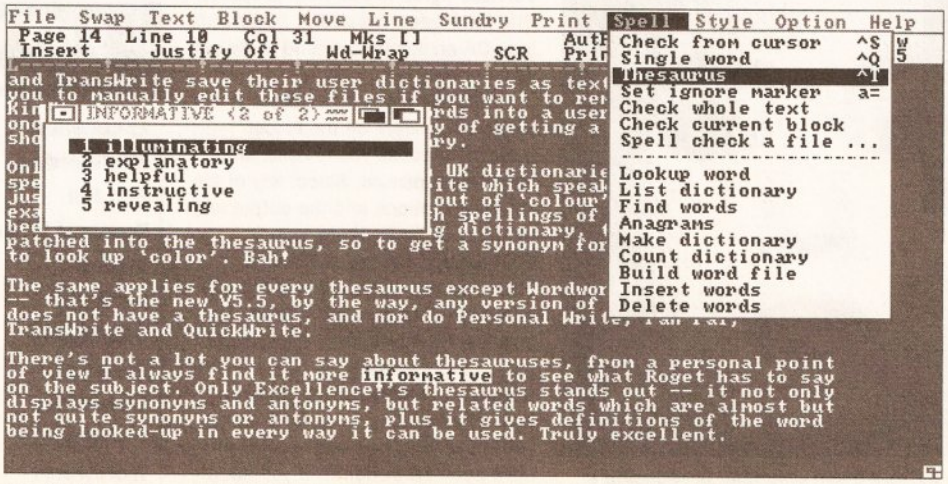
A much better way is to stick up a requester and let you click on a word that you have included by mistake, and then select a Delete button. *Wordworth* and *Pen Pal* do it this way from within the main program, while *Scribble!*, *Excellence!* and *WordPerfect* provide separate utilities for easy management of dictionaries. *QuickWrite*, *ProWrite* and *TransWrite* save their user dictionaries as text files and force you to manually edit these files if you want to remove words. *KindWords* will allow you to enter words into a user dictionary, but once they are entered there is no way of getting a 'bad' word out short of deleting the whole dictionary.

Only *Wordworth* and *Protext* come with UK dictionaries, all the others speak American English, except *ProWrite* which speaks both at once – just as useless if you miss the 'u' out of 'colour' or 'labour', for example. And while the proper English spellings of some words have been patched into *ProWrite*'s spelling dictionary, they haven't been patched into the thesaurus, so to get a synonym for 'colour' you have to look up 'color'. Bah!

The same applies for every thesaurus except *Wordworth*'s and *Protext*'s – that's the new version 5.5, by the way; any version of *Protext* below this does not have a thesaurus, and nor do *Personal Write*, *Pan Pal*, *TransWrite* and *QuickWrite*.

There's not a lot you can say about thesauruses; from a personal point of view I always find it more informative to see what *Roget* has to say on the subject. Only *Excellence!*'s thesaurus stands out: it not only displays synonyms and antonyms, but related words which are almost but not quite synonyms or antonyms, plus it gives definitions of the word being looked up in every way it can be used. Truly excellent.

continued on page 26



***Protext* has a very fully-featured spelling checker, along with a thesaurus.**

CHECKOUT
SPELLING CHECKERS

Excellence!	●●●●●
KindWords	●●○○○
Pen Pal	●●○○○
Personal Write	●○○○○
Protext	●●●●●
ProWrite	●●●○○
QuickWrite	●●●○○
Scribble!	●●●○○
TransWrite	●●○○○
WordPerfect	●●●○○
Wordworth	●●●●○

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continued from page 24

EXTRAS

There are lots of extras that turn an adequate word processor into a better one: features like mail merge, glossaries and macros, on-line help, automatic table of contents and index generation.

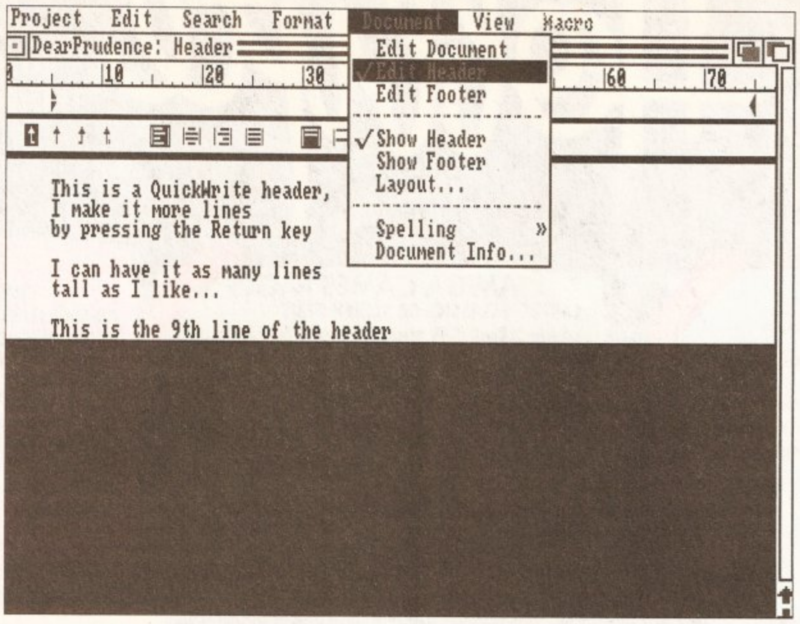
The only one of the word processors that is half-way serious about mail merge is *Protext*. They can all (including *Protext*) be set up to read a data file of names and addresses and print out a 'personalised' version of a standard letter to each name in the list, but what if you wanted to only send that letter to all those people on the database who lived in Manchester? Or to all the people aged between 21 and 35? Or to all the members whose subscriptions have lapsed?

Only *Protext* has the power to read a data field and make a decision one way or the other depending on the content of that field. All the other word processors require you to preprocess the data file using a database.

But with power comes complexity. You'll have to learn how to use *Protext*'s 'stored commands'. The manual gives plenty of examples and tries to keep away from the term 'programming' but that, in effect, is what you are doing because *Protext*'s stored commands comprise a small but powerful programming language.

I have seen a complete invoicing system and database written entirely using *Protext*'s stored command language – it was called *Protext Office* – not to mention a light-hearted 'dating agency' program which matched people of the same perversions to each other. *(I told you not to mention the light-hearted dating agency program which matched people of the same perversions to each other – Ed.)*

The language is similar in principal to Basic, but perhaps a little more difficult to master because each of the 'keywords' is only two letters long; the manual will be your constant companion here.



***QuickWrite*'s header and footer generation is simple and effective.**

All the packages will let you use the word processor to create a data file, adhering to strict rules concerning what characters delimit fields and records. Along with this, *Wordworth* can read *Superbase* and *Mailshot Plus* files, *Protext* (v5.5) can read *Prodata* files, and *Pen Pal* can read the files created by its own built-in database.

FRONT AND BACK

The ability to create a table of contents (TOC) and an index is a massive help to technical writers – you can't imagine what tedious and time-consuming jobs these are to do manually unless you have ever had to do them.

If you're looking for these features, you haven't got a lot of choice – only *Excellence!*, *Protext* and *WordPerfect* can do both, while *TransWrite* can generate a simple index but not a TOC. By 'simple' I mean that every marked word or phrase appears in the index list in alphabetical order, there is no facility in *TransWrite* for creating index sub-headings with an indented list of related topics below.

TransWrite's strength is that you only have to mark the first occurrence of a word for the page number of every occurrence of that word in the document to appear in the index.

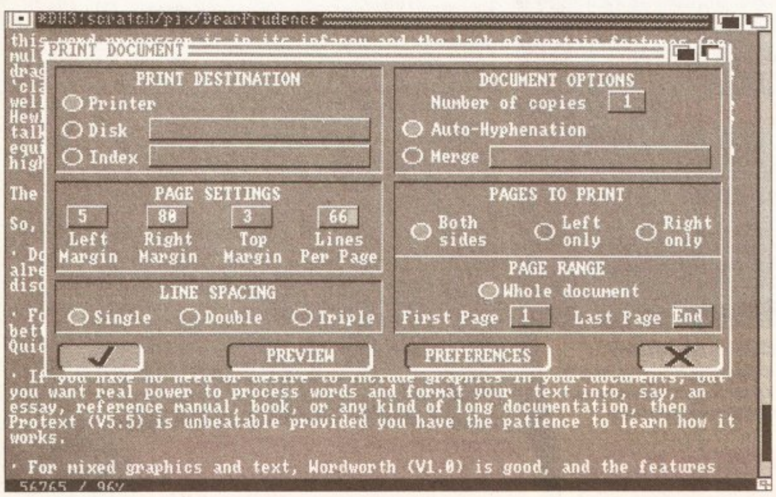
Excellence!'s index and TOC generation does not cater for sub-headings either, and only those words or phrases marked will appear in the lists, meaning that you have to mark every occurrence of something to do the job properly – search and replace speeds this job up. It's the same with *Protext* and *WordPerfect*, but both of these allow for index and TOC headings and sub-headings.

ON THE BUTTON

Macros are time savers. They are lots of keypresses collected together and executed by pressing a single key. A macro could be something as simple as a commonly used word or phrase, or something more complex like a collection of text editing or document formatting keypresses or menu selections. Some word processors call this feature a 'glossary'.

Only *KindWords*, *Pen Pal*, *Personal Write* and *Scribble!* have no macro support at all, while *ProWrite*'s and *QuickWrite*'s macros work via their ARexx ports (which means you have to buy, install and learn how to use another program called ARexx).

Wordworth's macros are restricted to commonly used words and phrases, which is admittedly what most people use them for, but you couldn't, for instance, press a single key to get *Wordworth* to mark the paragraph the cursor is on, open a new document and copy that paragraph into the new document.



***TransWrite* has a fairly wide range of printer output options.**

Protext will let you do this, but only if the operation can be achieved by issuing keypresses or commands – any menu selections are ignored, although to be fair most operations of the program can be achieved by typing commands at the *Protext* command line.

TransWrite's macros can include commands as well as words, but you are restricted to just 10 of them.

WordPerfect's macro system is different in that it allows you to set up a macro to do anything at all you want, but as well as assigning macros to single keypresses you can give them filenames and execute them from disk at any time. Actually, *Protext* can do this too, although it calls them 'exec' files because (unsurprisingly) they are files of commands that get executed.

Protext and *WordPerfect* are extremely flexible in the macro department, but both are rather user-unfriendly, even though both can 'record' the macros rather than forcing you to enter a complicated string of special commands. What we want is a macro facility as powerful as *WordPerfect*'s or *Protext*'s, but as simple to use as *Wordworth*'s.

Once again, *Excellence!* excels. Macros in *Excellence!* are defined by typing them once, highlighting them and then giving them a name and an optional keypress in the glossary requester. These macros can include graphics as well as words. Text editing and document formatting commands – in fact anything that can be selected from a pull-down menu – are defined by using special commands between curly braces. For example, {menu font, times, 12 point} would define that menu and sub-menu selection as a macro. It's a simple system to use, and because you give macros names (subsequently selected from a list in the glossary requester) as well as keypresses it's user-friendly as well as fast and flexible.

continued on page 29

CHECKOUT
EXTRAS

Excellence!	●●●●●
KindWords	●●○○○
Pen Pal	●●○○○
Personal Write	●○○○○
Protext	●●●●●
ProWrite	●●○○○
QuickWrite	●●○○○
Scribble!	●●○○○
TransWrite	●●○○○
WordPerfect	●●●●○
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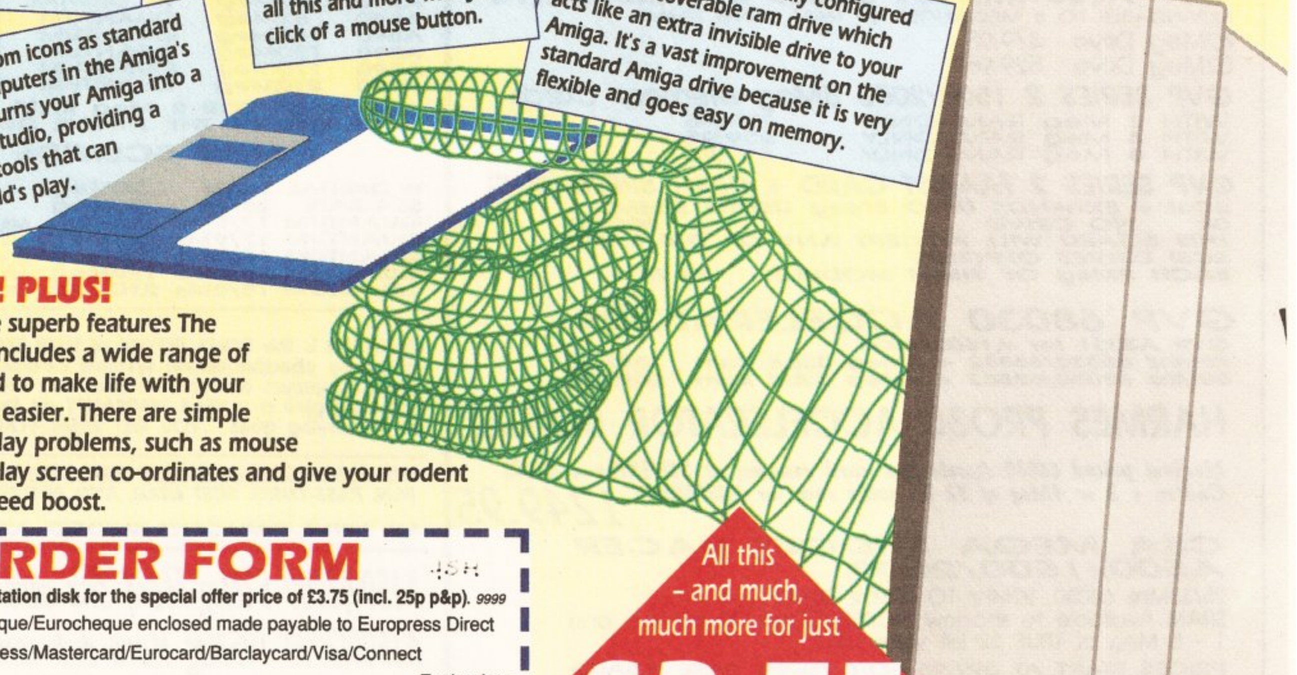
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MANUALS

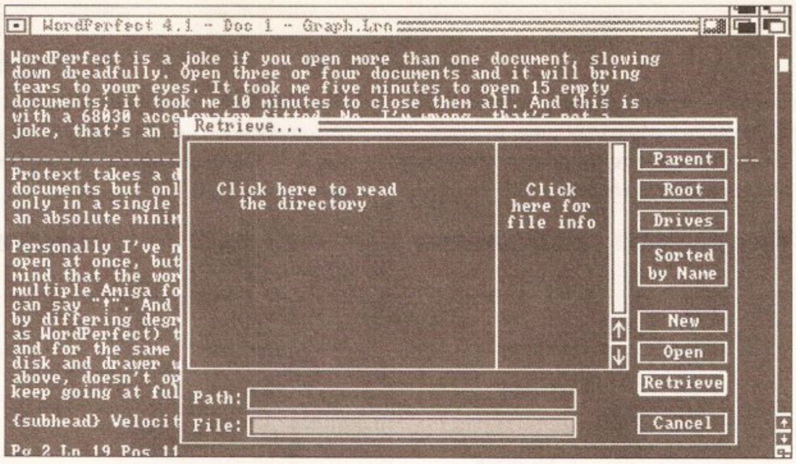
The more powerful a word processor is, the more features it has, and the better the documentation needs to be so that the user can access the full functionality of the program.

For beginners there needs to be a good tutorial which encompasses most of the commonly-used features, followed by one or more tutorials to show how the advanced features work. For people who are using the software day after day in some kind of professional capacity, there needs to be a comprehensive reference section, and a good index so that topics can be found quickly.

KindWords, *QuickWrite* and *TransWrite* are so easy to use that they don't need big manuals. You could use any of these three for years and never feel the need to look in the book. Which is just as well because they are slim paperbacks that wouldn't stand up to a lot of mauling. *Scribble!* is pretty easy to use as well, although the manual will be needed to learn how to format documents using its 'dot' commands. The manual describes these adequately but is short on examples. A hardcover ring-folder ensures that the *Scribble!* manual will stand up to continued use.

WordPerfect's manual is unbelievable; I've never seen one like it. More than 600 A5 pages in a thick hardcover ring-folder, it is a step-by-step guide to almost every single facility the program offers. The tutorial is about 230 pages long and structured into 29 easy-to-follow lessons. But there's an awful lot to take in, and even the 'reference' section is really another tutorial, taking you through each individual feature step by step, sometimes a little hurriedly. You need the manual to learn how to use *WordPerfect*, and you will need time and patience to work through it.

Excellence!'s manual is the same physical size as *WordPerfect*'s, but it only contains half as many pages. The paper is twice as thick, and a lot of pages have only a few lines on them; those pages that are 'full' leave a two-inch bottom margin. The same amount of information could have been presented in a third of the space. But then the manual wouldn't look so impressive, would it... There's nothing wrong with what's on the pages, everything is described adequately, and after an initial read-through you probably won't need to pick it up again.



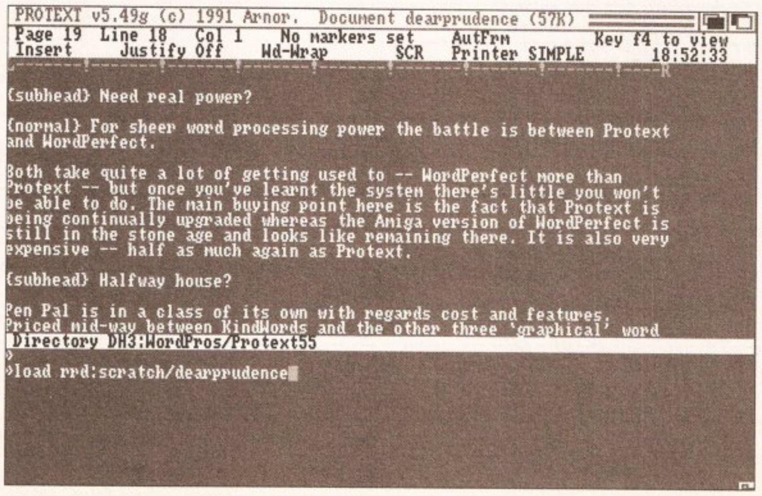
WordPerfect **has a reasonably sophisticated file requester.**

ProWrite's manual is about on a par with *Excellence!*'s (adequate), but it comes on 200 spiral-bound pages between soft covers. Far more ecologically sound. The index is poor, making some features hard to find if you need to read-up about them.

Personal Write hails from Italy and the manual has plainly been translated into English by an Italian. While it just about succeeds in getting its message across, these are some of the most long-winded 160 pages I have ever had to read. It's entirely possible that *Personal Write* has some features I have yet to find. It was only while re-reading the section on mail merge that I discovered that *Personal Write* will let you embed printer control codes in the text in order to change printer styles, fonts or colours. The manual is badly structured and translated, but at least it does come in a hardcover ring-folder which will stand up to being thrown at the wall in frustration.

Protext's main manual is almost 400 A5 spiral-bound pages. It's absolutely crammed with reference information and, not surprisingly, has a comprehensively cross-referenced index, enabling you to go straight to the pages which discuss any particular feature. A tutorial manual is also supplied, along with an advanced manual dealing with creating your own *Protext* printer drivers. As with *WordPerfect*, the *Protext* manual will need to be kept constantly by your side for quite a while before you've really got the hang of all the program's features.

I've left *Pen Pal* and *Wordworth* until last because their manuals (both softcover, spiral-bound) deserve special mention. Screen shots or diagrams on almost every page, well written text, expertly laid out with unhurried step-by-step examples of how to use almost every feature. Both have good tutorials, tips on getting the best results, and well-indexed reference sections. Neither can be faulted without picking for nits. My hat comes off to Softwood and Digita for taking the time and trouble to get it right.



***Protext*'s earlier versions were on other machines – and it sometimes shows!**

CHECKOUT
MANUALS

Excellence!	●●●○○
KindWords	●●●○○
Pen Pal	●●●●●
Personal Write	●○○○○
Protext	●●●●○
ProWrite	●●●○○
QuickWrite	●●●○○
Scribble!	●●●○○
TransWrite	●●●○○
WordPerfect	●●●●○
Wordworth	●●●●●

FINALLY...

It would be unfair to pick a 'best' word processor from the 11 on test because we are not comparing like with like. Even if we split them into two categories, yes-graphics and no-graphics, the massive differences in price have to be taken into consideration.

So, rather than throw unexplained 'blob ratings' at you, in conclusion I will point out what I consider to be the main assets and pitfalls of each word processor.

ON A TIGHT BUDGET?

I would not recommend *KindWords* at all. While it is the cheapest word processor that has a graphics capability, and while it is certainly easy to learn how to use, it is slow, quirky, inflexible, and it crashes far too often for my liking. Yes, you can process words with it. But why anyone would want to will forever remain a mystery to me. The 'feel' of a word processor is every bit as important as the features. *KindWords* feels like it would much rather you used another program to process your words with.

But cheap doesn't always mean nasty. Take *Personal Write*. It, too, has a quirky feel to it, but it's as good for bashing out words as any word processor I have ever used, and it has a quite versatile PostScript output option to boot, which partly makes up for its lack of much in the way of really powerful document formatting features.

However, if bashing out words is all you need a word processor for, *TransWrite*, at £40 rrp, will do nicely. It's lightning quick, easy to use, and don't forget that it comes with a spelling checker and has some quite powerful document formatting commands. It can also be used to create indexes.

The other two packages I'd put in this 'word bashing' class are *Scribble!* and *QuickWrite*. For an extra £10 you are getting a thesaurus and a few more document formatting features, but nothing to write home about. After all, *QuickWrite* is a cut-down version of *ProWrite* and *Scribble!* is from the same people as *Excellence!*.

NEED REAL POWER?

For sheer word processing power, the battle has to be between two contenders: *Protext* and *WordPerfect*.

Both take quite a lot of getting used to – *WordPerfect* more than *Protext* – but once you've learnt the system there's little you won't be able to do. The main buying point here is the fact that *Protext* is being continually upgraded, whereas the Amiga version of *WordPerfect* is still

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WORD PROCESSORS ON TEST

This is by no means a full and comprehensive chart of every feature of all the word processors on test. There are many features common to every word processor, most notably in the text editing and document formatting departments; things like marking blocks, cut/copy/paste, multiple page sizes, multiple measurement systems and so on – far too many to mention. These common features have been omitted from the chart for the sake of clarity – row upon row of 'Yes' under every heading would not be a lot of help to anyone.

	EXCELLENCE!	KINDWORDS	PEN PAL	PERSONAL WRITE	PROTEXT
TEXT EDITING					
Multiple documents	Yes	No	Yes (4)	Yes	Yes (36)
Place markers (for quick goto)	No	No	No	Yes (1)	Yes (9)
Timed autosave	No	No	No	No	Yes
DOCUMENT FORMATTING					
Rulers	Multiple	Multiple	Single	None	Multiple
Multiple fonts	Yes	Yes	Yes	No	No
Multiple columns	4 snaking	No	No	No	cut-and-paste
Headers/Footers	Yes/Yes	Yes/Yes	Yes/Yes	Yes/No	Yes/Yes
Footnotes/Endnotes	Yes/No	No/No	No/No	No/No	Yes/Yes
Page numbering	arab	arab/rom	arab	arab/rom	arab
Facing pages	Yes	No	Yes	No	Yes
Widow/orphan control	No	No	No	No	Yes
Automatic hypenation	Yes	No	No	Yes	Yes
Mix text and graphics	Yes	Yes	Yes	No	No
GRAPHICS					
IFF import up to ...	32 colours	32 colours	4,096 colours	No gfx	No gfx
Move/Resize/Crop	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes		
Vertical text flow	No	No	Auto/Manual		
Contour text flow	No	No	Auto/Manual		
Show/hide graphics	No	No	Yes		
Snap to grid	No	No	Yes		
Drawing tools	None	None	Lines/boxes/fills		Lines (IBM)
PRINTING					
Embed printer control codes	No	No	No	Yes	Yes
Use multiple printer fonts	No	No	No	Yes	Yes
Mix graphics and printer fonts	Yes	No	Yes	No	No
Amiga font output	Yes (lo-res)	Yes (lo-res)	Yes (lo-res)	No	No
Best IFF graphics output	8 cols/greys	16 cols/greys	4,096 cols/greys	None	None
PostScript	Yes	No	No	Yes	No
SPELLING CHECKERS					
Dictionary supplied	USA	USA	USA	None	UK
Number of words	90,000	100,000	110,000		110,000
Quick dictionary	No	No	1,500		500 or 5,000
User dictionary	Yes	Yes	Yes		Yes
THESAURUSES					
Thesaurus supplied	USA	USA	None	None	UK
Words	unspecified	40,000			43,000
Cross references	unspecified	470,000			827,000
EXTRAS					
Mail merge	simple	simple	simple	simple	simple/conditional
Index/TOC creation	Yes/Yes	No/No	No/No	No/No	Yes/Yes
Glossary/Command macros	Yes/Yes	No/No	No/No	No/No	Yes/Yes
On-line help	None	Brief	Full	None	Full
Printed pages screen preview	Yes	No	Yes	Yes	Yes
VERSION ON TEST	v2.00b	v2.0	v1.3 Rev 18	v3.0	v5.5

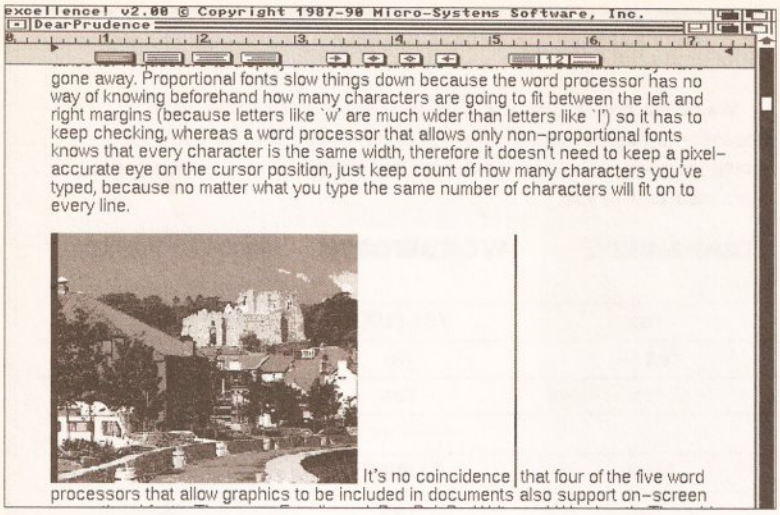
– THE FEATURES CHART

Instead of listing every single feature, we have picked out about 40 features which we consider raise an ordinary word processor from the 'casual-user' category into the realms of a serious, professional productivity tool.

We do not advise that you make your decision on which word processor to buy just on the strength of the table below. Instead you should read the accompanying feature and decide which features are the most important to you.

PROWRITE	QUICKWRITE	SCRIBBLE!	TRANSWRITE	WORDWORTH	WORDPERFECT
Yes (8)	Yes (10)	Yes (4)	Yes	Yes (100)	Yes
No	No	No	Yes (4)	No	No
No	No	No	No	Yes	Yes
Multiple	Single	None	None	Multiple	None
Yes	No	No	No	Yes	No
5 snak/par	No	No	No	No	5 snak/par
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
No/No	No/No	No/No	No/No	No/No	Yes/Yes
arab/rom/alph	arab/rom/alph	arab	arab	arab/rom/alph	arab/rom/alph
Yes	No	Yes	Yes	Yes	Yes
No	No	No	Yes	No	Yes
No	No	No	Yes	Yes	Yes
Yes	No	No	No	Yes	No
4,096 colours	No gfx	No gfx	No gfx	4,096 colours	No gfx
Yes/Yes/No				Yes/Yes/No	
Manual only				Auto/Manual	
Manual only				Auto/Manual	
Yes				No	
No				No	
None				None	
No	No	Yes	Yes	No	Yes
No	No	Yes	Yes	No	Yes
Yes	No	Yes	No	Yes	No
Yes (hi-res)	No	No	No	Yes (hi-res)	No
8 cols/greys	None	None	None	16 cols/greys	None
needs ProScript	No	No	No	No	No
USA/UK	USA	USA	USA	UK	USA
100,000	50,000	103,000	unspecified	110,000	115,000
No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes
USA	None	USA	None	UK	USA
unspecified		unspecified		30,000	unspecified
300,000		470,000		140,000	unspecified
simple	simple	simple	simple	simple	simple
No/No	No/No	No/No	Yes/No	No/No	Yes/Yes
needs ARexx	needs ARexx	No/No	Yes/Yes	Yes/No	Yes/Yes
None	None	None	Brief	Full	Full
No	No	Yes	Yes	No	Yes
v3.1.1	v1.0	v3.05	v2.0	v1.0	v4.1.12

continued on page 32



***Excellence!*'s ruler allows easy formatting of the text.**

continued from page 31

in the stone age and looks like remaining there. *WordPerfect* is also very expensive – half as much again as *Protext*.

HALFWAY HOUSE?

Pen Pal is in a class of its own with regards to cost and features. Priced mid-way between *KindWords* and the other three 'graphical' word processors, it handles pictures superbly, it even lets you draw lines and boxes, but its Amiga font output is poor and there is no support for embedding printer control codes within the text in order to manipulate the built-in fonts of a printer.

But then, it does come with a superb, albeit simple, database.

But then again, it can't do multiple columns.

And it doesn't have macros.

And it can't create an index or table of contents.

It really is sitting in a little no man's land of its own, neither here nor there. Which is a crying shame because *Pen Pal* is a pleasure to use, having arguably the best 'feel' and friendliest user-interface of the lot. All it would take would be higher-quality text output to raise *Pen Pal* to the top of the tree because it is so much cheaper than its competitors.

MAKING IT PRETTY

As far as incorporating fancy fonts and IFF graphics into your documents is concerned, sadly none of the 'graphical' word processors is entirely satisfactory.

Excellence!'s Amiga font output is on a par with *Pen Pal*'s (poor), and its graphics capability is worse, effectively restricted to eight colours or fewer, so it's fine for black-and-white clip art for example, but there's no proper text flow at all. However, it does have a limited PostScript support and some truly excellent features, like its thesaurus and glossary, that stand head and shoulders above the others.

ProWrite is a big disappointment. Its Amiga font output is good because of its 'scaling' trick, and while its graphics support appears to be excellent on the face of it, the colour output I've seen can only be classed as adequate, and black-and-white output is poor. On top of this, *ProWrite* cannot automatically flow text around a graphic, it has to be done manually. And to get PostScript and macros support you need to spend more money on ProScript and ARexx, which is a diabolical liberty considering *ProWrite*'s price.

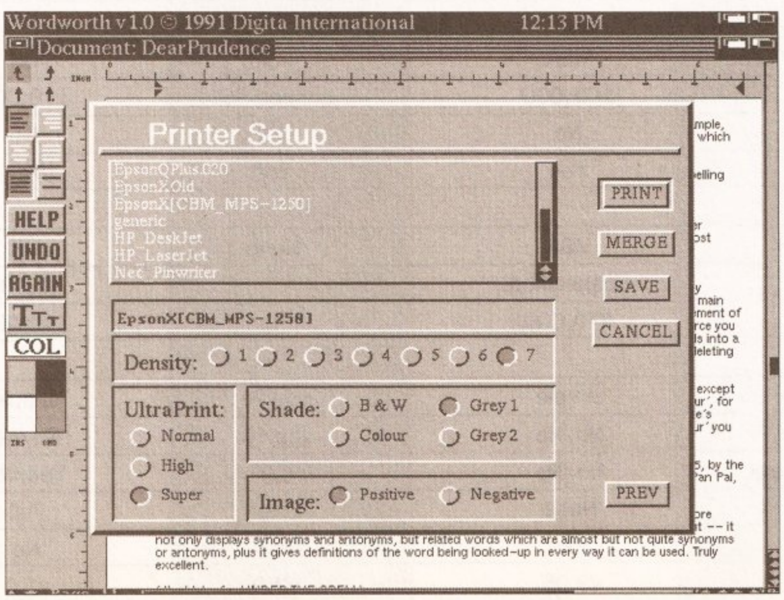
Wordworth's Amiga font output is as good as *ProWrite*'s, and its graphics support is excellent thanks to the brilliant colour mapping facility. But this word processor is in its infancy and the lack of certain features (no multiple columns, limited macros, no index or table of contents generation) drags it down from the high pedestal it may one day occupy. Support for the 'classic 35' PostScript fonts is being added for an "imminent" version 1.1, as is support for many more built-in printer fonts, like those inside the Hewlett-Packard range of LaserJet and InkJet printers, but there will be others – and we're talking proportional printer fonts here with correct width on-screen equivalents – which will mean that you'll be able have graphics and mix-and-match high quality proportional printer fonts within a single document.

THE BOTTOM LINE

So, all things considered, I have four concrete recommendations to make to anyone considering purchasing a word processor.

- Don't buy *KindWords*, you will almost certainly live to regret it. If you already own *KindWords*, consider trading it in with Digita for a £30 discount off *Wordworth*.
- For bashing out words quickly and cheaply, *TransWrite* (v2.0) is a lot better than its price suggests. I'd certainly rate it above *Scribble!* and *QuickWrite*.
- If you have no need or desire to include graphics in your documents, but you want real power to process words and format your text into, say, an essay, reference manual, book, or any kind of long documentation, then *Protext* (v5.5) is unbeatable – provided that you have the patience to learn how it works.
- For mixed graphics and text, *Wordworth* (v1.0) is good, and the features being added to the "imminent" version 1.1 upgrade will raise it way above the standard of *Excellence!* and *ProWrite*.

And it pleases me no end to remind you that both *Protext* and *Wordworth* are British products. Which, putting guns and flags and patriotism aside, means that technical support can be supplied by the developers, instead of the developers' UK agents or a company in the States, and is quicker, easier and cheaper to get at than staying up at night to ring a US helpline. AS



***Wordworth* has a comprehensive printer setup requester.**

SHOPPING LIST

Excellence!........................£117.44
By Micro Systems Software, Inc.
☎ 010 1 407 790 0772

KindWords........................ £51.03
By The Disc Company, Inc.
☎ 010 1 313 665 5540

Personal Write.................. £29.95
By Cloanto Italia

ProWrite £143.00
By New Horizons Software, Inc.
☎ 010 1 512 328 6650

QuickWrite £51.03
By New Horizons Software, Inc.
☎ 010 1 512 328 6650

Scribble! £51.03
By Micro Systems Software, Inc.
☎ 010 1 407 790 0772

TransWrite £40.82
By Gold Disk, Inc.
☎ 010 1 416 828 0913

WordPerfect £233.83
By WordPerfect Corporation
☎ (UK) 0932 850500

All the above distributed in the UK by:

HB Marketing Ltd
Unit 3
Poyle 14
Newlands Drive
Colnbrook
Berks SL3 0DX
☎ 0753 686000

Pen Pal............................. £79.95
By SoftWood, Inc.
☎ 010 1 602 431 9151

Distributed in the UK by:

Gordon Harwood Computers
New Street
Alfreton
Derbyshire DE5 7BP
☎ 0773 836781

Protext £152.75
(£110 until the end of October)
By Arnor Ltd
611 Lincoln Road
Peterborough
PE1 3HA
☎ 0733 68909

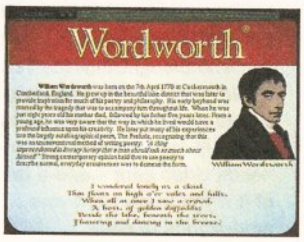
Wordworth......................£129.99
By Digita International Ltd
Black Horse House
Exmouth
EX8 1JL
☎ 0395 270273

Wordworth

a writer's dream

The graphical nature of Wordworth® makes producing documents faster and easier. The WYSIWYG display shows exactly how your printed document will look, different fonts, styles and sizes, headers and footers, graphics and so on.

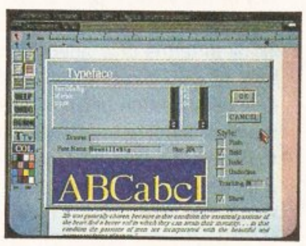
Commands are grouped under a series of pull-down menus, accessible either by the mouse or keyboard. Frequently used commands have on-screen icons, including Help, should you need it.



Experience the look and feel of the new and exciting WB2 (even if you use WB1.3).

Digita's® innovative *Human Interface Protocol*™ is incorporated and sets new standards in speed, style and elegance. Each document is a separate multi-tasking window, which means you could for example, print one while editing another.

Graphics have always been the Amiga's strong point. Now it's better than ever. Pictures from Deluxe Paint can be placed in a document, and then sized, scaled and dragged (text automatically reformats around the image).



Wordworth's enhanced fonts will give you the very best printed quality. You can also print special symbols, such as boxes, arrows and so on. Better still, you can mix graphics, Wordworth's enhanced fonts, Amiga fonts, Colorfonts and your printer's own fonts, all on the same page.

Wordworth integrates with most word processors, and so you'll be able to use any documents created with Kindwords, Wordperfect, Prowrite, Protext, Excellence, and any ASCII or IFF Text document.

As Amiga Computing put it, "the only Amiga word processor to rival Protext for speed. I would recommend the program to anyone thinking of buying their first word processor or upgrading from Kindwords."

Wordworth is written in the UK by Digita. Which means you'll be using an English Collins spelling checker and thesaurus, and you'll know where to come for professional support.

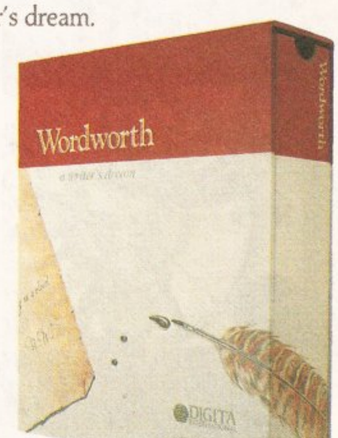


When Amiga Format said "a new word processor that will give the rest of the world a run for its money" they weren't joking. "Wordworth is the most user-friendly word publisher on the Amiga." Praise indeed.

The only way to really appreciate Wordworth is to use it. Phone 0395 270273 for more information or, write to Digita, FREEPOST, Exmouth EX8 2YZ.

Wordworth costs £129.99, which includes VAT, postage and packing. If you already own a word processor and purchase Wordworth direct from Digita, you can save £30 by returning your original disks with your order.

Wordworth will be your writer's dream. However, if you don't agree with us (and purchased directly from Digita), return it in original condition within 7 days and we will refund your money.



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Hot toast

Gary Whiteley and Phil South have been looking at NewTek's Video Toaster, a powerful video mixing and graphics editing system for the Amiga

The Video Toaster has been making headlines across the computing and video worlds for more than a year. It's an add-in board which gives an Amiga the power of a professional video editing system at a fraction of the price. And it offers unparalleled features for creating and editing "true colour" graphics with millions of colours. The only problem is that the system at present only works with the American NTSC television system, not our own PAL setup. However NewTek promises that there will be a UK version soon, so we shipped over an American system to see just what the Toaster was capable of.

SOFTWARE SLICES

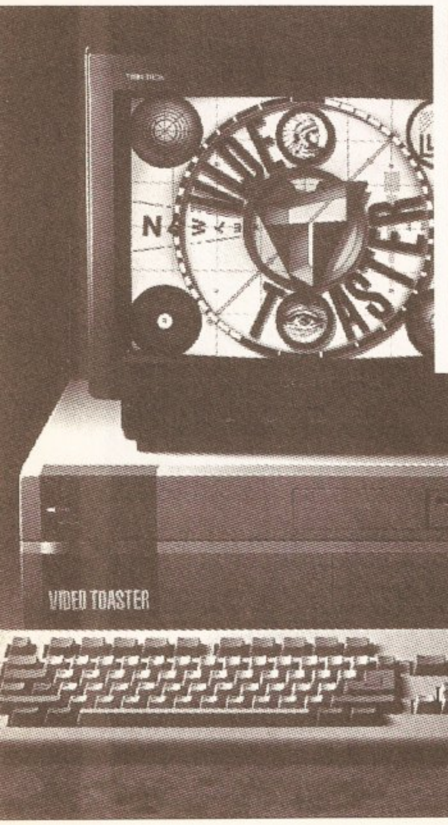
For US$1,595 you get the Toaster hardware itself, plus eight disks of software and a manual which is the size of your average *Yellow Pages*, only heavier and in a nicely stencilled plastic ring binder.

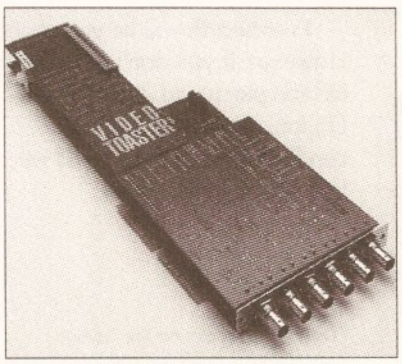
The software, quaintly referred to as 'slices', consists of all the necessary programs to drive the Toaster. There is the *Switcher* interface, which is the heart of the package, *Lightwave 3D* modelling and animation software, a character generator called *ToasterCG*, *ToasterPaint* (NewTek's 24-bit paint package), *ChromaFX*, for colour processing and other chroma effects, lots of special fonts for *ToasterCG*, objects for *Lightwave 3D* and demo material in the shape of pictures, framestore images and several *ToasterCG* examples.

WELL CONNECTED

The Video Toaster hardware is certainly well connected, being an amalgam of three circuit boards which fit into the video slot of Amiga 1500/2000/2500s (but not 3000s!) and having at its heart four custom-built very large scale integration (VLSI) chips to carry out the Toaster's specialist functions. There are four video inputs and two video outputs – all in the form of standard BNC connectors.

Installation, though not difficult, isn't for the faint-hearted, as it entails swinging the power supply of the computer out of the way in order to get the board into the video slot, after which it neatly fills all the space between the power unit and the case of the machine. And that's all there is to it!





The Video Toaster comes in two models – a stand-alone job (left) for US$3,995 or, if you already have an Amiga capable of accepting it, as an add-in board (above) for just US$1,595.

All there is to fixing the Toaster hardware inside the Amiga, that is. But that's just the start. For those of you who thought that the Toaster would turn you into the world's greatest video producer instantly you're in for a bit of a shock. It also needs video gear – and a fair amount of it if you really want your productions to cook.

OK, you could use the Toaster as a stand-alone device for 3D modelling, 24-bit painting, frame-grabbing and so on, and simply output the results to video. But then you'd be wasting what looks like a very versatile and exciting tool – and most of those shiny BNC connectors on the back of the Video Toaster.

Granted, you don't have to use any of the video inputs at all, but imagine what you could put in there! Think in terms of a video camera or two, or a couple of video machines or a combination of each. Think of them all feeding in at once. And that's where *Switcher* comes in. It's a screen emulation of a fully-functional video mixing desk with up to seven inputs available, since in addition to the four video feeds there is also a framestore built in to the Video Toaster to provide two assignable frame buffers, and there's also a background channel – thus seven in all.

Then there are the two video outputs. These are for Preview and Program. For the uninitiated these output either the video source selected on the Preview bus of *Switcher* or the video output from the Program bus, which is the final, definitive output from the Video Toaster. So in order to be able to really see what you're doing on your video production you'll need at least one video monitor in addition to the Amiga monitor. This is so that you can monitor both the Preview/*Switcher* and Program outputs. The Amiga monitor is necessary because the Toaster requires that the Amiga RGB signal is connected in order for it to properly encode video signals. The addition of a second video monitor will allow you to display a Preview signal separately and use the Amiga monitor for *Switcher*'s control panel.

But that's not all. The video inputs will need to be synchronous with each other – in other words, all the signals arriving at the Toaster have to be perfectly in step with each other. This is necessary for clean video effects to take place and necessitates the addition of further equipment – namely Time Base Correctors at the rate of one per VTR. And any video cameras will also need to be capable of being externally synched to the system if you plan on using more than one simultaneously.

In fact, the sky's the limit as far as equipment goes. You could run a very simple Toaster setup of a single camera input and just one video recorder for the output. Or you could run an elaborate, three camera, one video player, one recorder system. It all depends on your needs and/or your funds. But you could also do most of the work in an 'off line' environment – at home, for example – by producing the graphics, captions and animations that you require in advance. Then hire an edit suite, take your Amiga and Toaster setup along, hook up and off you go.

HOME AND AWAY

The NTSC version of the Video Toaster is full-spec, US broadcast quality so it could be used (in NTSC system countries) by network TV, cable channels and production and post-production houses. (Indeed, it already is – see the 'toaster news' panel on page 36.) It could also be used by artists and animators to produce high-quality work onto video tape. And, cost-wise, it wouldn't be surprising to see the Video Toaster become commonplace in educational institutions running TV courses, in corporate and independent production facilities and ultimately into hard-core video enthusiasts' workrooms. In fact, anyone who is seriously into video will already have some, if not most, of the necessary equipment to utilise an appropriately equipped Amiga and a Video Toaster in their productions.

And what of a PAL version for us here in the UK? Well, it's coming along, but its release date is as yet unscheduled. It could be as much as a year away, but do believe us when we tell you that it's going to be well worth the wait...

Video slices

The *Switcher* interface software supplied with the Toaster is first and foremost a comprehensive emulation of the mechanics of a special effects generator (SEG) and digital effects generator. Whilst there are some notable omissions, such as joystick wipe positioning, picture scaling, chroma key and full control over border and background colours, there are enough Toaster digital effects alone to make even hardened video editors salivate like Pavlov's dogs. And NewTek is making amends right now – adding to and refining the Toaster to make it even more scrumptious.

For the non-technical amongst you, I'll explain what *Switcher* does by starting with some basic information on vision mixing.

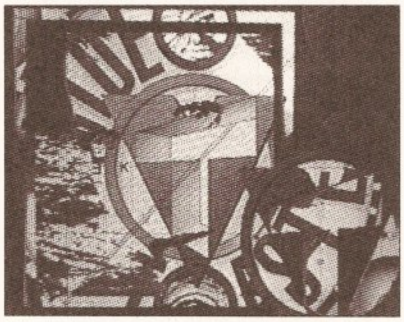
MIX AND MATCH

Now, you remember those four video inputs? Well, if this were a solid, three-dimensional mechanical SEG bolted into an edit suite console you could press a button on one of the input selector rows (busses), press another button on the other bus to select the other video source, select the type of transition, background colour, border colour and size and so on, then use the T-bar to control the speed of the transition between one video source and the other. The result of all this will be that the video signals are mixed, wiped or otherwise effected by the SEG and the resultant combined signal emerges through the Program output to the storage medium of your choice – usually video tape.

With Video Toaster, all the mechanical aspects of the SEG are replaced by a graphical interface, and all selections which would have been made on the mechanical SEG are instead made by using mouse button clicks or, if you prefer, keyboard selections.

So, at its simplest *Switcher* could be used for cutting, fading or wiping between the various inputs available to the Toaster.

Those were the basics. Now for something a little more advanced: Toaster Digital Effects (or TDEs). These are what, for me, really put the Toaster up there with the big boys of TV equipment. Until now the price tag for these kinds of effects units has been beyond the reach of many serious video users – unless they had a very friendly bank manager. Priced in the the multiple



Incredible effects are available at the touch of a button.

thousands of pounds range, digital effects for video have generally been luxuries, squeezing many a post-production budget dry. The Toaster is changing all that – permanently. Not necessarily for the established majors, but for corporate, industrial, cable, educational and other volume producers the Toaster is going to make a very big splash.

It's very difficult to describe some of the TDEs available – and there are currently 128 of them ready to go at the click of a mouse button. The *Switcher* screen has pictorial representations of each TDE available, and guess what? They're referred to as croutons! Reveals, conceals, flips, tumbles, bounces, spins, blinds and other TDEs such as the very descriptively named, but totally indescribable on paper, 'Kicked Puppy'!

By using the TDEs from *Switcher* you get almost exactly the same results as you would with a full-blown, rather expensive digital effects generator – at a fraction of the price. Spin a picture around to reveal another, roll one up and leave another in its place, fly one in then fly it out again. And while there are no true 3D effects – which require much increased processing power – I think that there's plenty here to appeal to every user, although I'd like to see some more fancy wipes such as stars, diamonds, hearts and even the lowly circle.

Performing a TDE is very simple, and can be done manually or automatically. For a manually-controlled effect either use the left mouse button to drag the T-bar down, or move the mouse while holding down the right-hand button. Automatic TDEs are made either by hitting the space bar or clicking on the 'Auto' button. The timing of automatic TDEs can be set to slow, medium or fast, although I'd like to see NewTek incorporate some kind of absolute time setting, which would be very useful when you need an accurately timed and smooth transition between images.

When you plug live video signals into the VT, things really start looking good. TDEs which previously appeared fine with framestore images take on a whole new dimension. Trails, folds, fly-offs and all the other TDEs are suddenly working to full effect with real, moving video pictures!

Some of the TDEs are stunning. But words don't do them justice. If you can find one (and they're in short supply at the moment) take a look at NewTek's demo video. It's hard to believe that a so-called "games machine" can do all this.



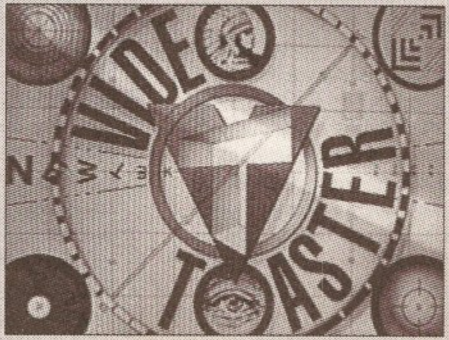
"I've been looking at the video aspects of the Video Toaster, and trying to decide whether it really does perform as well as its reputation suggests."
Gary Whiteley

SOME DRAWBACKS

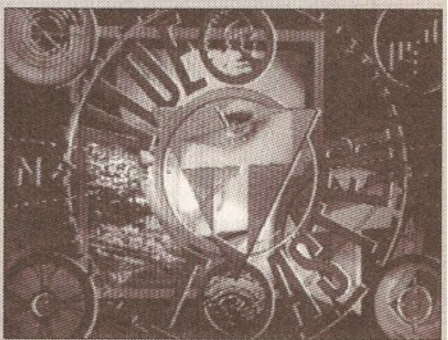
There are some small problems, unfortunately. If you look closely at certain TDEs in operation, especially ones where pictures are expanded or compressed, there is a digital breakup as the picture segment is altered in size. This is due to a lack of interpolation processing within the Toaster, resulting in an imperfect compression or expansion – for example, parts of the picture become increasingly 'chunky' or go missing altogether. This problem could be solved but would probably be expensive, requiring more hardware and programming to correct. However, don't despair. If you're viewing the video screen from a normal distance you'll hardly notice the joins.

continued on page 36

Using *Switcher* along with some of the other software it's easy to create effects like those shown on the right – just take a graphic, overlay a moving video image and combine the two in any way that you want to.









Multiple images are a piece of cake to create, and can be overlayed on to static or moving backgrounds. Note the logo which has also been placed in the picture. The grab on the right is just one of the 'explosion' effects.

continued from page 35

There is also a small problem with the timing of the mask around the TDEd picture when using video, resulting in a slight black edge on the left of the image and a cropping on the right. Again, look closely and you'll see it, but all equipment has its limitations and the Toaster is no exception. Sometimes cost and creativity are more important considerations than absolute quality.

There's also a bug in the software which saves frames to disk. If the mouse is moved during saving, the result will be that a series of broken, coloured lines will be saved on the picture. The current fix for this is to keep those twitchy fingers off the mouse while saving, turn it upside down and bolt down the cat.

One final gripe on the video side is that when you're using video and a framestore image simultaneously it just isn't possible to use TDE effects which require compression or expansion (which is most of them). They become reduced to wipes which mimic the style of the original TDE. This is because half the framestore has to be used for four fields of video, whilst the other half contains the framestore image, leaving no room for the TDE manipulation.

While testing with video input we found that adding more memory definitely improves the smoothness of the TDEs. Initially we were using 4Mb of Fast RAM on our Fatter Agnus-equipped A2000, but increasing this to 8Mb gave far smoother transitions.

FRAME IT

With a live video source hooked up (a VTR or camera), the Toaster can grab a frame of video in 24-bit mode. This is simply done: just hit the 'Freeze' button in the *Switcher* to grab from the selected source. Then, if there is some jitter caused by movement, simply enter the Preferences screen, click on the jitter removal icon, and a few moments later the image is rock steady. Grabbed frames can be saved as framestore pictures and imported to *ToasterPaint* for any kind of surgery you wish to perform. No doubt Doctor South has some interesting thoughts on this in his Toaster graphics section (page 42).

KEY IT

The Video Toaster also features luma keying facilities directly from *Switcher*, with full control over 256 brightness levels (from full black to peak white) and with either positive or negative settings, enabling one image to be keyed very crisply over another. Keying has many applications, such as superimposing titles over video by replacing the title background colour with the video picture, or for replacing a section of one picture with the another picture (this is known as a 'wipe key effect'). Linear keying is also possible, and will be mentioned in more detail in the next section.

TOAST WITH CHARACTER

Put another slice in the Video Toaster. *ToasterCG* is a fully-featured character generator which has anti-aliased fonts, scrolling, crawling, background generation and many other features.

Put simply, *ToasterCG* has a workspace made up of 100 pages, called a 'book'. Only one book is available at any one time, but others can be recalled from storage as necessary. Each book can contain 20 different fonts, and each page can have a different font on each line. Finally, there is the 'project', which contains the current set of TDEs and the status of all the slices (that is, whether they are loaded into memory or not) and, of course, the contents of the book.

There are five different page formats, each being used for specific tasks. Blank pages are simply that – blank. They cannot contain any information but can be used as dividers between other pages. Key pages are *ToasterCG* pages which key stationary text over graphics or video. Framestore pages are full-screen pages which can have a generated background as well as text and can be saved to either framestore. Crawl pages key text which moves from right to left over video or graphics, in either the middle or the bottom of the screen, and scroll pages are similar to crawl pages, but roll the keyed text from the bottom of the screen to the top.

Scroll and crawl pages can be run at one of four preset speeds, and cannot have shadowing or use the special 24-bit Chroma Fonts provided with *ToasterCG*.

Over 30 high-quality fonts are provided, and it is possible to convert any Amiga bitmapped font for use with *ToasterCG* by using the supplied utility, *Toastfont*, which works very efficiently and produces high quality results. You could even use graphics as fonts, making symbols, logos, grand prix cars and so on all available for presentation as Chroma Fonts, although I could find no indication in the manual of how this can be accomplished. A subsequent call to NewTek confirmed that Chroma Fonts are currently rather difficult to create on a DIY basis, but software will soon be available from the company to redress this shortcoming.

All the functions of *ToasterCG* are accessed via the keyboard only – something I have found annoying in other character generators – even though there are on-screen icons available. So function keys become very important with *ToasterCG* and they often have several uses, since the <Alt> and <Shift> keys can also be used in their selection.

Text can be shadowed and bordered (in any colour of your choice) but can only be manually kerned. Face colour is easily changed, as are shadow type and direction and border size. Font selection is easy and adding new fonts to the current book from the available font list is a piece of cake. Sadly, however, there are no facilities built in for automatic underlining, emboldening or italicising: your font style must already be in bold or italic when selected, and underlining can only be simulated by using a graphic separation character – which is simply a horizontal line.

continued on page 41

TOASTER NEWS

The really hot bits of news about the Video Toaster at the time of going to press are, according to NewTek:

- **The Video Toaster will be used in the production the new *Star Trek* movie, *Star Trek 6: The Lost Country*.**
- **In the next version the company will be improving the software to enable the Toaster to work at a resolution of 1,900 x 3,000 lines, enabling direct-to-film effects.**
- **CBS is using *Lightwave 3D* to design its new animated WCBS logo.**
- **The Playboy Channel uses the Video Toaster in all its productions.**
- **NewTek has sold more Toasters in the US than Grass Valley has sold video switchers, with over 20,000 Toasters sold so far.**
- **Upgrades will allow favourite effects to be put in Bank A, and two new TDE banks are on the way.**
- **New software upgrades currently in the pipeline include more effects banks, some (limited) 3D video effects, joystick positioning and assignable compression/expansion of images. More support for background channel will be included, along with improved versions of many of the slices. And there's talk of an additional board to support ChromaKey via component inputs.**
- **The next release includes particle generation for *Lightwave 3D*, to build clouds, snow, dust and other particulate objects. In fact, NewTek expects software upgrades to be available every 6-8 months.**

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CHECKOUT Switcher

Features ●●●●○
Plenty of options already, but there's still room for more!

Ease of use ●●●●●
Anyone should be able to use *Switcher* within a very short time. Simple and straightforward.

Speed ●●●●○
Access to all slices and croutons is fast – only loading of *CG* pages and framestore images may take a little while.

Quality ●●●●○
Readability is high, and everything is easy to understand.

Documentation ●●●○○
Not as comprehensive in details of actual usage as I would have liked. Some things have just got to be worked out by yourself.

Overall rating ●●●●○

CHECKOUT ToasterCG

Features ●●●○○
I would like to see more flexibility in text entry, styles and placement. Also more types of movement – teletext, for example.

Ease of use ●●●○○
Beyond the keyboard-only restrictions, *CG* is pretty easy to use.

Speed ●●●○○
Rendering times can be quite slow (on 68000 machines) and more variety is need in scroll and crawl speeds.

Quality ●●●●○
Output quality is high, with even converted bitmap fonts looking very good. ChromaFonts are great, too.

Documentation ●●●○○
Fair, with easy-to-follow tutorials.

Overall rating ●●●○○

CHECKOUT ChromaFX

Features ●●●●○
Customisable and storable effects, in addition to 3Q pre-made ones. Plenty of control over the results.

Ease of use ●●●●○
Fairly straightforward, but needs some experimentation for true familiarity.

Speed ●●●○○
Can take a little time before an effect is ready to be used.

Quality ●●●●○
The preset effects look good, and so should the ones you build.

Documentation ●●●○○
Fair, with easy-to-follow tutorials.

Overall rating ●●●●○

continued from page 36

When you've made your pages, all you have to do is render them up (in 24-bit) and you're ready to go. Rendering framestore pages can take a little while, but they can then be saved to disk. Scroll and crawl pages will be available for use almost immediately and key pages do not take long at all. Pressing <F10> then lets us see our page on the Program or Preview output so we can decide if all is well before returning to *Switcher*.

Back in *Switcher* it's a simple task to trigger our prepared pages. Select the chosen page by scrolling through the listing window. Press <Enter> and it will be prepared for action – and will indicate this by causing one of the *Switcher* buttons to flash on and off. Then, when you trigger a transition (by using <Space>, the 'Auto' button or via the right-hand mouse button), the *ToasterCG* page will be faded, scrolled, crawled or TDEd – depending on the type of page you recalled – over video or framestore graphics.

The quality is as you would expect – crisp, clean and smooth. And by using linear keying (which is actually a type of luminance keying) any shadows applied to the text can be made to appear semi-transparent over the background video image. A nice touch, and a useful one at that.

I did find that I missed being able to play a sequence of pages back one after another, as is possible with other character generators, and this may cause problems when subtitling. Other features I would like to see include being able to mix fonts and colours on the same line (especially in the scroll and crawl pages), the addition of simple graphics for text boxing and underlining, and more flexibility and variability with the speed of scrolls and crawls.

COLOUR PROCESSING

The third slice directly related to video output is called *ChromaFX*. Its purpose is to cause colour processing effects on incoming video signals – posterising, filtering, solarising and so on. There are about 30 ready-made effects, and these can be adjusted directly from the *ChromaFX* screen. So, when a video signal is effected with *ChromaFX* it will be 'painted over' with the selected effect. Again, these effects are hard to describe, but filtering, for example, would be like having a graduated filter applied over the video signal, allowing, say, the sky to be tinted red without effecting the rest of the picture. Or the whole picture could be washed over with rainbow colours, snow storms, weird colour effects, NewTek's Nuke effect (a false colour, posterised kind of affair) and so on. The *ChromaFX* arsenal can be extended by saving custom changes to disk. Just imagine how you might improve some of those holiday films!

IT'S ALSO A GENLOCK!

As a final touch, the Video Toaster can be made to operate as a lowly genlock. By exiting via the Toaster Preferences screen you will be returned to Workbench and the Amiga signal will be genlocked by the Toaster. I was surprised to be able to load *Deluxe Paint III* and run an animation over the top of a 24-bit graphic. The quality looked very acceptable, too – a small amount of colour smearing but even the notoriously difficult reds were pretty viewable.

WHAT YOU NEED

A minimum system configuration for the Toaster suggests itself from what we found out using the system, and the following is sensible according to those tests:

- An Amiga 2000
- 8Mb of Fast memory (9Mb total)
- At least a 40Mb hard disk
- A 68030 card of some kind

If that wasn't enough, you will also need some video equipment: again, we think that a sensible set-up would comprise:

- A video camera
- Two good-quality VTRs (for playback)
- Two time base correctors to square up the signals from the VTRs
- A recording VTR (with single frame capability)
- Two video monitors in addition to the one attached to your Amiga

GOBSMACKED

I was. Totally. To round up the video side of things I must say that I think we'll have to wait a good while before another Amiga product will touch the Video Toaster for features, quality and innovation... at any price! OK, it's taken since 1987 to get this far, and it's only been available in the States since October last year. So you don't mind waiting that little bit longer for the PAL version, do you? You do? So how's about it, NewTek? Please? Pretty please?

continued on page 42

THOSE TECH SPECS IN FULL

Note: just in case you missed the point, this review and spec applies only to the US TV standard NTSC model, but it's fairly safe to assume that most items (other than the NTSC specifications) will be retained on the PAL version when it finally becomes available.

- **Inputs:** 4 composite synchronous BNC with software controlled 75 ohm termination.
- **Outputs:** One Preview and one Program composite BNC.
- **Reference Video:** Composite colour or black burst on video input No. 1.
- **Trigger:** GPI trigger to joystick port.
- **Sync Generator:** Internally regenerated sync, black burst and blanking to full NTSC signal specifications.
- **Signal to Noise:** >55 dB.
- **Sampling Rate:** 14.31818MHz.
- **Memory:** 8 fields (expandable).
- **Frame Store:** Dual outputs independently routed to *Switcher*, storing 1, 2, 4 or 8 fields.

  Capacity: Up to 1,000 frames (per frame store device, depending upon available storage).

  Load Time: From RAM: <0.2 seconds. From hard disk: <3 seconds.
- **Switcher:** 7 inputs: External video 1 – 4, Digital Channel 1, Digital Channel 2, Matte Generator.
  Independently selectable Preview output.
  Linear Keyer: 16 steps at 70ns resolution. 256 steps at 280ns resolution.
  Luminance Keyer: Dual keyer for dual threshold keying or two independent keys. Dual clip level control with 256 steps. Key input switchable to any input or digital channel.

continued from page 41

Graphics slices



"I've been looking at the *ToasterPaint* and *Lightwave* slices of the Video Toaster; just how good are they?"

Phil South

The most incredible thing about the Toaster is that so few people have heard of it in the UK. Obviously a big spread in the UK's favourite Amiga magazine can't hurt that situation, but it's surprising that the big story about how the Toaster is making a mockery of highly priced video/graphics machines in the US is taking so long to spread over here.

The ramifications of what the Toaster could do to the state of the art in video are wide ranging and could spell the end of edit suit domination of the creative video market. For a long time mainframes and incredibly expensive graphics workstations have had a monopoly on quality computer graphics, but this is all set to change. With the onset of 24-bit graphics cards (including the Toaster) this power is being given to the public at large. Now, with the Toaster, the video effects and paint facilities normally offered by the likes of Quantel's paintbox and Silicon graphics are at last in the hands of art scoundrels like us!

LET THERE BE LIGHTWAVE

Lightwave is the Toaster's 3D rendering package, written by *Videoscape 3D* author Alan Hastings. Like all the slices, you get to *Lightwave* through *Switcher*, clicking once to load it, and once again to actually use it. Once you've clicked on the *Lightwave 3D* crouton the first time, each time you run it again it will run instantly as it is held in memory.

To run *Lightwave* you need at least 5Mb of memory – and this is all needed if you intend to render anything of any size or complexity. 3D can be very time consuming at the best of times, and very processor-intensive to say the least, so an accelerator is needed if you want to cut down those rendering times, especially if you want to make frames for animation: at three hours per frame you stand to spend a lot of time with your Amiga locked up.

And talking about animation, you can't animate objects in real time either. Like most professional 3D systems, you have to find a means of rendering to videotape one frame at a time. This process is automated, and uses a simple protocol understood by single frame video rendering systems like Lyon Lamb. *Lightwave* can drive many different single frame recording devices, and has an ASCII command line for other, as yet unsupported devices, so commands can be typed straight in for transmission through the serial port. In this way it's probable that the Artbeat Simpatica system will soon feature Toaster compatibility, but obviously this won't be available until the unit is over here in PAL format and in quantity.

TRAVELLING LIGHT

There is so much in *Lightwave* that it's hard to know where to begin. First off there's a really mind-boggling array of transformations you can do, as the Todd Rundgren video for *Change Myself* shows (see the 'Todd is God' box on page 43). Most of the shape and form changing is done with envelope shapers, like a synthesizer, and these take all the hard work out of moulding your shapes into something else, or moving their textures about.

Gary reckons *Lightwave* is a bit odd to use, but I like it fine. Gary and I always approach 3D from a different angle, though. (You might say as it's 3D, we can approach it from any angle we like, but that's just being silly.) Gary is used to systems which deliver high quality but need a bit of work to get them running, as he has learned every tricky-to-operate 3D system going. So his favourite rendering packages are things like *Imagine* or *Turbo Silver*. I came into 3D quite late on, so I prefer simple things like *Real 3D* and *Lightwave*.

One of the things I really like about *Lightwave* is that everything happens on one screen most of the time, none of this tri-view business where everything from every angle is squeezed on to one screen. Of course there is that option if you like, but I don't like.

Animations are made using the same procedures, using 'tweening to get objects in motion, rather than letting you move the object and position each frame carefully before rendering. Each frame is rendered up as a wire frame, then you can test the animation in this form before committing to a full render. Once you have an object moving you can animate it to video frame by frame, and then certain animated effects become apparent, such as moving textures and bumps.

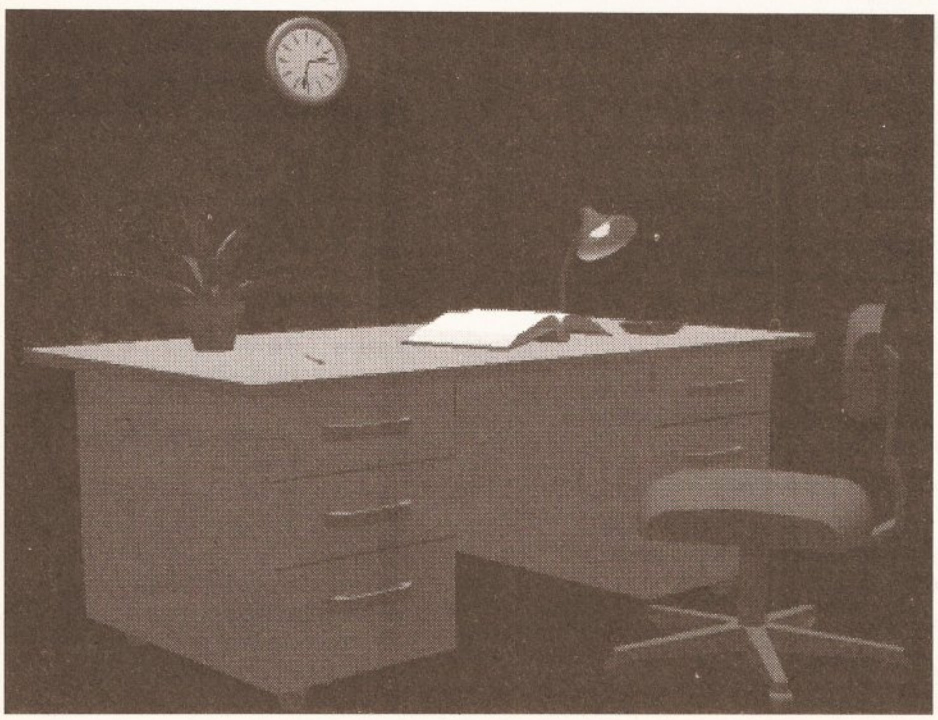
Objects are rounded using a full 'Phong normal interpolation', meaning that they look smooth even if they are made of 48 jaggy polygons. But if you want objects to look bumpy and they're not, you can do so with bump mapping. Bump maps can be made to simulate most surfaces, and just like *Real 3D* you create the bumpmaps of your own in *DPaint* or some similar package and then ship them over as brushes.

Ripples are another very exciting and beautiful effect, and these can be used to simulate water or even the ripples or waves in a flag. You can set up sources for the waves and set them in motion, and also dictate how tall the waves should be and how fast they move. The result is very attractive, and means you can do some very realistic liquid effects.

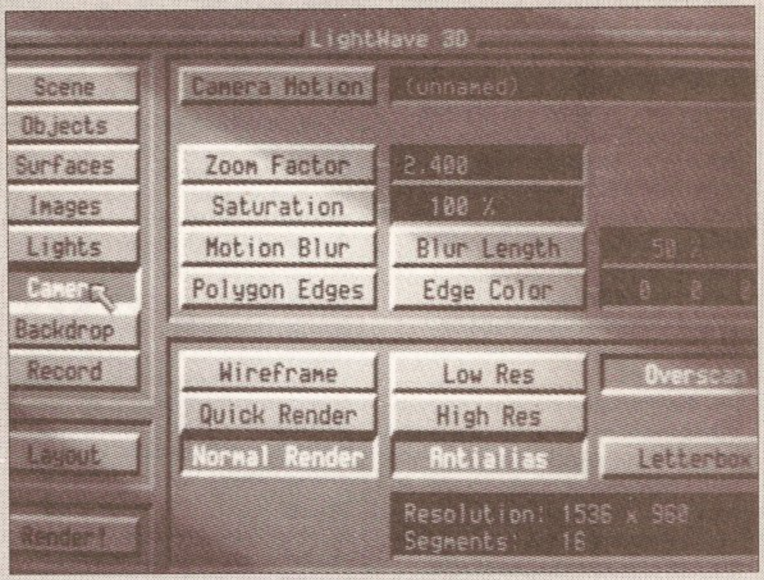
Lighting is a dream, with all manner of realistic lighting effects,

THE CREDITS

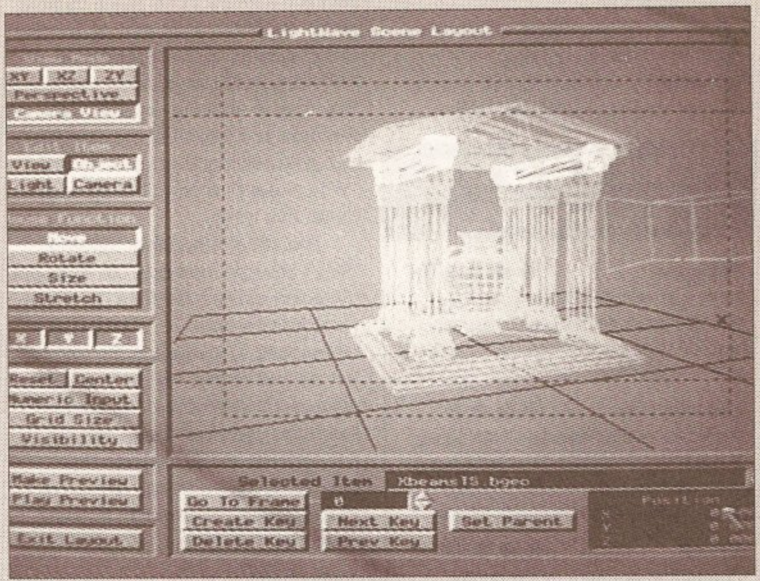
Thanks are due to Ira Curtis Coleman of Bitsoft, Watford for technical troubleshooting and being kind enough to set up all his NTSC equipment for us to zap video signals through the Video Toaster. To Stan Hearle of Artbeat (them again!) for supplying much-needed extra memory so that we could get the Video Toaster running in the first place. To 33 Video, Luton for loaning a video monitor capable of showing NTSC. And finally to NewTek, without whom none of this review would have been possible anyway!



***Lightwave* is a very impressive 3D rendering package which creates effects like this.**



Lightwave's main screen contains all of its available function – all can be accessed at the click of a mouse button.



Editing objects, lighting and so on is simple to do. The program makes every user action as intuitive as possible.

which all react as if you had a bunch of lights in a studio and were moving them around, altering the barn doors and filling in the shadows. Lights can also move around, and their motion is governed by the same simple tweening effects.

DOWN AT THE DOCS

The tutorials in the manual are many in number and take you through loading objects, changing colours, setting up scenes, simple animation, and editing animation. This covers most of the first batch of "how do I do this?" sort of questions which the user is likely to have, but what I wanted to read was a quick guide on how to simulate certain surfaces. Obviously the information is in the manual, but you have to delve around for it a bit. Then there it was, at the back of the Advanced Tutorials section. Why weren't they in with the rest of them? Ah well. Some of the tutorials require that you render to a single frame VTR so you can see the effect, although one advanced demo takes over 30 hours to render on an un-accelerated Amiga!

The rest of the information is presented in a menu-by-menu style, with bald descriptions of what is what and ways in which you might like to use them. However, a lot of the pictures illustrating points in the book were missing, which meant that we had to guess at what the effects looked like, or render them up ourselves.

Those little niggles aside, though, the manual does talk about everything – albeit in what seems like minimal detail. You read a passage, try it, and think it can't possibly be as simple as that. And before you know it, it **is** as simple as that, because you have the result on the screen. I think that on balance I would have preferred a colour manual, so I could see properly what sort of effects the options I was selecting would have.

The manual problems are actually being solved by NewTek, and

> **"Gary and I spent most of our time just saying 'Wow, look at that!' "**

no doubt there are other tutorials in the making. In the US there are a lot of *Lightwave* video tutorials and stuff like that, so expect some of these to be converted when the Toaster pops up on these shores.

A COUPLE OF NIGGLES

Some silly things become apparent after a bit of tinkering. Like the fact that lights all have to be deleted together if you want to get rid of just one, although I figured out that you could just turn off any unwanted lights like you would in a real studio. Gary mentioned that it would be nice to have a 'zone' feature (like in *Turbo Silver*, for example) so that chosen areas can be checked rather than rendering the whole image.

Rendering times are acceptable, and this is mainly because it's not a ray-tracer as such, although you'd never know it to look at the results. A 68030/040 card would be of some considerable benefit to shorten rendering times, or you'd need a few Toasters running at once. Reflection mapping makes up for the lack of traced light rays, but this is a rather strange effect in most cases, especially as the mapping only seems to reflect sky and ground, not any objects. You can, of course, make a picture of the surrounding objects and map it to the object you want to reflect them on but that's too complex for most purposes. Shadow and fog options certainly slowed rendering down, which is shame as these, along with edge opacity, are things which make a render look more real, lending depth of focus to otherwise clinically sharp images.

One thing which really did get under my skin was the lack of a loop in animation previews. You have to keep pressing the button, and the animation goes through once and stops. This is an obvious omission that I hope will be corrected in future revisions of the program – it is certainly a problem that needs addressing.

Finally, the Toaster also takes over the machine, making multi-tasking a little difficult – impossible, in fact, although in order to multi-task a Toaster and another application you'd have to be packing about 10-15Mb anyway, I guess.

continued on page 44

TODD IS GOD

The *Change Myself* video is the first music video ever to be created with the Toaster. Todd Rundgren is well known for being a techno hippy, and an all-rounder in the music, graphics and general good-egg stakes. He was so impressed by the Toaster at a Mac show (what on earth was it doing there?) that he bought 10 of them and commenced making this stunning video. I had NewTek send me a copy of its demo reel, which features *Change Myself* as part of the fun, and I had Ira convert it from NTSC to PAL so we could watch it. It's simply electrifying. The video took a whole six months to render and edit, and all the objects are created and made by Todd himself.

Some of the most exciting effects are done by mapping his face on to objects, but more than that, the face is moving and the lips are synched to the words on the record. A video must have been shot, and each frame from the vid painstakingly transferred via the framestore on the Toaster, to be mapped on to the object on each frame of the animation. No wonder it took six months, even with ten Toasters!

NTSC ONLY

We have to emphasise that the version of the Toaster we have been reviewing here is the NTSC standard version, designed for use with the US TV system, and will not work in any way on the PAL-format equipment you have at home.

continued from page 43

THUMBS UP

Despite all the grumbling about bits and bobs, most things about *Lightwave* are utterly brilliant, like the way that you can make the camera or lights track an object, and the fact that the camera looks like a camera when you catch sight of it on a view, and the lights all have little barn doors on them, so you can see which way they're pointing. A lot of the features and facilities implemented in *Lightwave* made me ask myself, "Why on earth aren't all programs made this way?"

The sheer amount of different things you can load into the thing got me going as well. IFF files, 24-bit IFF files, framestores, all of which can be mapped to shapes in the editor. But as well as the regular *Lightwave* objects (of which there are copious examples), you can load I objects and *Videoscape 3D* objects too. Obviously, the same guy wrote the *VVideoscape 3D* program, so this makes perfect sense.

TOASTERPAINT

ToasterPaint is pretty much *DigiPaint* with a 24-bit rendering capability added. The screen is a four-by-four HAM super bitmap, and you scroll around the screen doing all the usual *DigiPaint* things to your picture. You can load a frame store or a *Lightwave* still frame for editing, or you can create a new graphic of your very own using the extensive tools available. Whether you like *ToasterPaint* or not depends on whether you liked *DigiPaint*. I did, Gary didn't, but we'll have to agree to disagree on that one.

Why *DigiPaint*? Well, aside from the fact that it's a ready-made interface and one of NewTek's own programs anyway, it is in fact a 24-bit program to start with. That's right, but it uses the 24-bit stuff to give it that smooth dithered look we all know and love. So it's a simple move to open the thing up and make it render to a framestore rather than the screen.

You need a minimum 5Mb of RAM to use *ToasterPaint*, and although this is fine for most things, you still have to remove the *ToasterCG* slice if you want to run it at all, as memory is at a premium with 5Mb. 9Mb is really the most practical amount, as this allows you to do all the swap page effects and rub thru – an effect where you draw on one page and the other page peeks through the gap, rather as if you were cutting through the top picture. Users with more memory will be able to cut out larger brushes from Toaster 24-bit images and paste them around the place with impunity.

Brushes can be warped and tiled, just like in *DigiPaint*, and all the nice sexy transparency and colourising effects work just like in the original program. The difference is that in the new incarnation the pictures are rendered to a 24-bit buffer, so the effects are much smoother and contain more colours than are possible to imitate in HAM.

PROBLEMS?

I did wonder whether the fact that circles came out as egg shapes was down to the amount of diddling around with NTSC to PAL, or whether this was really happening. It's hard to be sure when there's so much converting going on. In any event, it's hard to judge the quality of the program's geometrical precision without it being a proper PAL piece of equipment.

The only other problem I had was the speed of re-rendering each time you loaded or resized a shape. This would be halved or quartered with an accelerator board, of course.

The manual suffers here too, but the lack of proper illustration was more than compensated for by the wealth of tutorials. Good luck with the new manual, guys!

SUMMING UP

Wow. That was my initial reaction, and it still holds true. Gary and I spent most of our time with the Toaster just flipping screens about and saying "Wow, look at that one!" The Wow Factor takes a long time to die down, and I'm not sure that I'm over it even now that I've run a scope over it and know its limitations. I'm still a Toaster fan, and from the very first moment I saw it running, I knew that this was the video production gear for me. I don't really care that it's not up to scratch from a PAL point of view (a tad nitpicky in my view), or that there are better quality boxes out there. The Toaster is an all-in-one box that I can afford, and all those other boxes aren't. I also don't care that you need a lot of ancillary equipment to make it all go properly – I can live with that if my bank manager can. What I do care about is that the Toaster is a hot item, and does some extremely sexy stuff for a cheap initial outlay.

NewTek says the PAL version will be out "some time in the next 12 months", although the company always says that, even if you ask every six weeks.

I can wait. No, really I can. It's not going to be easy, but I can wait.

Remember (once again) that the version of the Video Toaster we reviewed was an NTSC version, intended for the America market, and won't work on PAL equipment.

If you want more information on the availability of a PAL version, you can ring NewTek in the States on 010 1 913 354 1146. Also, keep reading* Amiga Shopper *– we'll let you know as soon as a UK version of the Toaster is shipping. AS

CHECKOUT LIGHTWAVE

Features ●●●●●
A fully featured 3D rendering package, which although not a ray tracer certainly delivers photo-realism with the minimum ammount of effort.

Ease Of Use ●●●●○
A fast and intuitive interface, with a host of easy-to-apply effects. Creating a bump map, mapping it to a sphere and fast rendering took only around 15 minutes.

Speed ●●●●○
Comparable with state of the art ray tracers, which is no bad thing. Quick renders took 3-5 minutes, full renders 2-3 hours.

Quality ●●●●●
The quality of the images was awesome, and they are very easy to edit. Mapping of bumps, textures, and even frame stores was easy and stunning to look at.

Documentation ●●●○○
Lacking the illustrations we were looking for. Some example files mentioned in the book were not on the disks, making trying some examples impossible.

Overall rating ●●●●○

CHECKOUT TOASTERPAINT

Features ●●●○○
Lacked a number of obvious tools which are easy to implement: a spray gun was one I particularly missed. Overall, the features are equal to most jobs you hit them with.

Ease Of Use ●●●●○
Simple to grasp, especially if you are used to *DigiPaint*, as it's virtually the same. Easy push-button tools for all functions.

Speed ●●●●○
Not over-fast, especially re-rendering frames after size changes on the Amiga screen. Well cached in places though, especially when sending images down to the frame buffer, when only the differences are sent.

Quality ●●●●●
The 24-bit screen quality is superb, and the raggy edges you get on the HAM screen on the Amiga don't transfer to the main screen in any way. High quality painting and editing of framestores too.

Documentation ●●●○○
Again a tad missing in the piccies department. What are the gaps on all those pages? I'd really like to know! Fortunately, I didn't need a manual, being a old time *DigiPaint* user.

Overall rating ●●●●○

CHECKOUT VIDEO TOASTER

Documentation ●●●○○
NewTek is currently making efforts to improve the bulky (and unwieldy) manual, which has a number of glaring omissions (mostly illustrations) and obvious weaknesses. Not the least of these is that the manual is so full of pages you can't turn them without tearing them.

Flexibility ●●●●●
Obviously, the Toaster is very flexible simply by having so many different facets. The upgrades are mostly in the software department in the short term, as the basic hardware to do the job is already inside the Toaster. More effects will mean greater flexibility.

Speed ●●●●○
Very dependent upon added hardware (fast CPUs, RAM and HDs) and what you're actually doing. *Lightwave* can be rather slow, but so can other 3D packages. Otherwise, with forethought the Toaster should be fast enough for most situations. In fact, as we tested most of the slices in an unaccelerated Amiga the speed is really quite good considering what the machine was shifting around.

Ease Of Use ●●●●○
All access is from one screen, no extra disks to load, and most functions are fairly simple once you understand them. *Switcher* allows you access to all the other programs, and provided you have enough memory you can have everything at your fingertips at all times, which is the most integrated system we've ever seen.

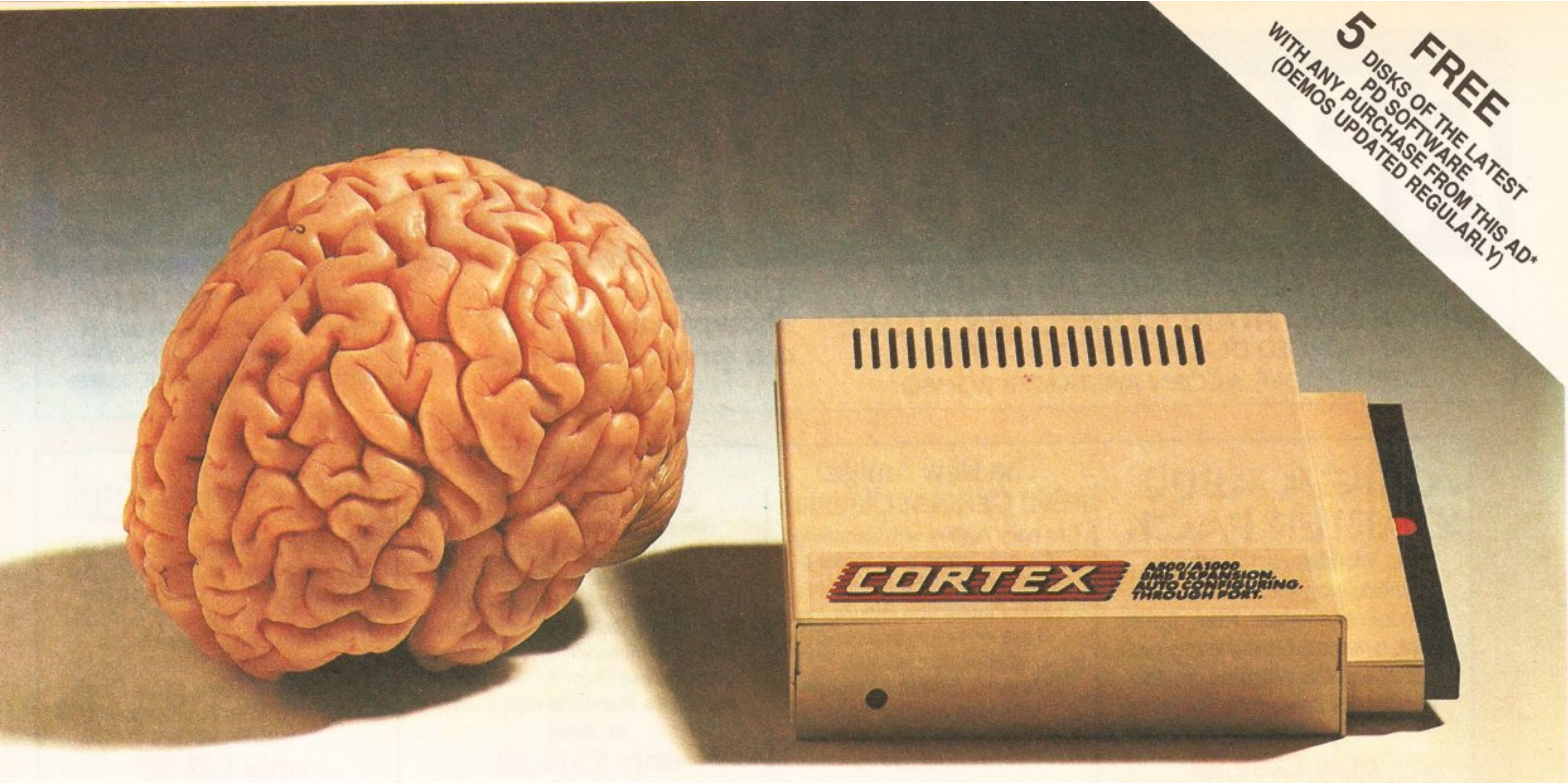
Quality ●●●●○
Some improvements could still be made in all areas of the Toaster, especially in the areas of sync and removing some of the annoying blanking mis-timings we experienced. But unless your average viewer whips out a scope and tests the signal, it looks good enough for most purposes as it's always in motion. Improvements in the quality will come with future upgrades already in the pipeline. Then the Toaster really will knock 'em dead, even in the more fussy professional PAL market.

Features ●●●●○
More features could still be squeezed in or improved, but as it stands there are already enough for most people. More will be added soon, but for the time being the Toaster is still feature-heavy enough for the most creative user.

Price ●●●●●
At $1,595 it's hard to give it less for all that the Toaster contains. Nothing delivers this quality of treatment for video and this level of integrated functionality. In short there is no competition at this price, and value for money is way up there.

Overall rating ●●●●○

An innovative and highly impressive product, let down slightly by a few niggling technical inconsistencies (manual, missing features or files and occasional video blanking errors). Nevertheless, a gizmo which will certainly be setting the PAL video production market alight, as it already has to NTSC in the States.



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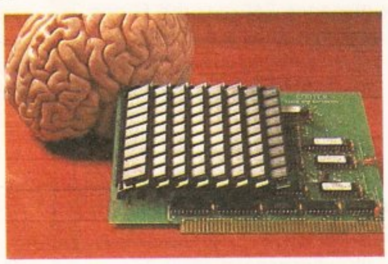
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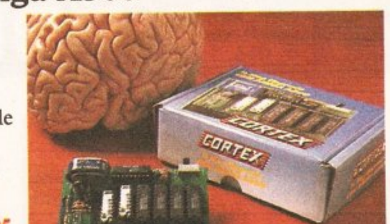
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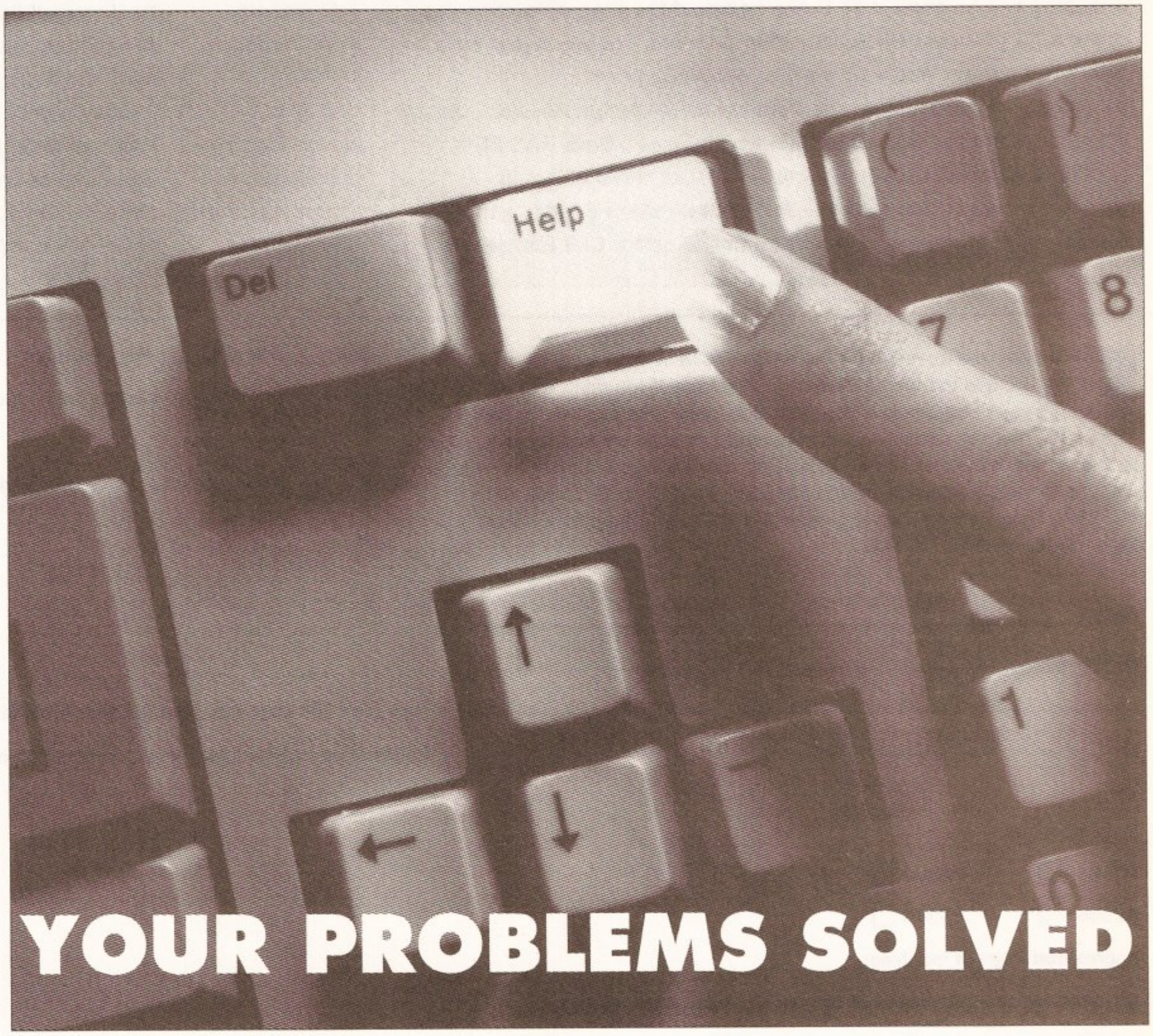
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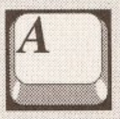
CONTENTS AT-A-GLANCE

AMIGA ANSWERS



SO WHAT DO ALL THOSE ICONS MEAN?


Beginners: this icon will appear next to any questions which are 'basic' in content.


General: this icon is used for any general Amiga-related queries.


Caution: be sure that you fully understand the answer before trying it out.


Danger: the answer to this question could well invalidate your warranty – or you!


Hardware: this icon is used to denote questions relating to general hardware.


Buying advice: we use this icon if the question asks us for buying advice.


Printers: this icon denotes a query about printers, printer drivers and so on.


Technical: any queries about programming will have this icon next to them.


Video: this icon relates to any query about using your Amiga with video hardware.


Music: this icon is for questions about MIDI, sampling, synthesizers and so on.


Programs: any program-specific queries have this icon next to them.


Comms: if your question relates to comms, this is the icon that we'll use.

WHATEVER YOUR PROBLEM WITH THE AMIGA, WE ARE HERE TO SOLVE IT

That's the task we have set ourselves in giving you the best possible support for your Amiga. We are confident that our experts can cope with any technical questions you can throw at them. If they don't already know the answer to your problem, they will find it out for you.

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of all three of *Amiga Shopper*'s consultant editors – Jeff Walker, Mark Smiddy and Phil South – and, of course, resident technical editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping on any subject. Each panelist will be dealing with queries in their own specialist area and it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem. Below is a list of their areas of expertise. It's a list that we will add to and update every month so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	**Video**
Stewart Russell –	**Comms, CAD**
Paul Overaa –	**Programming, music**
Mick Draycott –	**Hardware, programming, MIDI**
Jeff Walker –	**Desktop publishing, programming**
Mark Smiddy –	**AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives**
Phil South –	**Public domain, graphics, AMOS**
Jolyon Ralph –	**Programming, hardware**
Ian Wrigley –	**American sitcoms, maths, beer**
Stuart Anderton –	**Obscure bands and hi-fi**
Cliff Ramshaw –	**The really hard stuff that no-one else can answer**

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ______________________________

Address: ______________________________

____

____

Your machine:

A500 ☐ **A1000** ☐ **A1500** ☐

A2000 ☐ **A3000** ☐

Approximate age of machine:__________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ________

Chip memory available (see AVAIL in Shell) ______________

Agnus chip (if known) ______________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer __________

Extra drive #2 (3.5"/5.25") as DF__: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer ______________________

Extra RAM fitted – type, size in Mb and manufacturer ______________

Details of any other hardware which could help us to answer your question:

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

CHAINING HARD DRIVES



Please could you tell me how to daisychain two A590 hard drives together? On the hardware side, I think I have done the correct thing by only using one controller and connecting the other drive to the spare internal XT connector and spare power (I had to solder in extra 40-pin and 3-pin connectors to the controller board). I then changed the position of the jumper on the spare drive. The thing that has stumped me is the software side of things. What changes do I have to make, using the setup disk, as at the moment the system will not recognise either of the drives. When I switch the computer on, the system seems to read each drive it turn, but nothing much happens after that.

Jonathan McClelland
Bangor
N. Ireland

Your problem is a hardware one, not a software one. First off, you should only use one XT connector on the board. The space for the other connector and the other power lead are not spare for people to solder on to, but depend on which drive is supplied with the A590. With the Western Digital 20Mb drive, the XT connector is on the right and the power connector is on the left. The Epson 20Mb drive supplied with early A590s is the opposite way around. This is the only reason that the board has two possible connections for power and XT drive.

To run a second XT drive you have to make a 40-way ribbon cable with three 40-way connectors on it, plugging one end into the A590 XT connector and the other two ends into the two XT drives. You then have to change the jumpers on the XT drives so that one is set to master mode and the other is set to slave. This, again, will depend on which type of drives you have.

You will then have to find an external power source for the other XT drive, as the A590 only provides enough power for one drive. ***JR***

POOR, POOR VIDEO



Although a comparative newcomer to computers, I am keen on using my B2000 (with 40Mb hard disk and Rendale 8802 genlock) to produce graphics to use in my videos.

I have an edit suite comprising DirectEd Plus, VHS player, S-VHS recorder, Vivanco processor and an S-VHS camcorder which I use for filming and when I replay S-VHS tapes. I will eventually replace the VHS player with an S-VHS one.

Unfortunately, although everything else works quite well, I seem to have a problem with poor quality Amiga images when genlocked. I suspect that the genlock is in 'free wheel', as mentioned in the manual.

I think that the problem is in the connection to the 'CVBS IN' of the genlock. After trying various configurations, all I get is a rolling of display on the computer monitor and the S-VHS television connected to the edit suite, or else no improvement on the poor quality display on the TV screen. I had expected much better quality from a genlock costing so much. I appreciate that an S-VHS genlock would be preferable, but I am loathe to change the one I have.

I would really appreciate any help or advice which you could give.

D. A. Smith
Warrington

I spoke to Rod Welburn at Marcam (who make the 8802) and he advised me that there may be two causes for your problem – either your Amiga is malfunctioning or the genlock is misbehaving.

In order to isolate the problem, try the following:

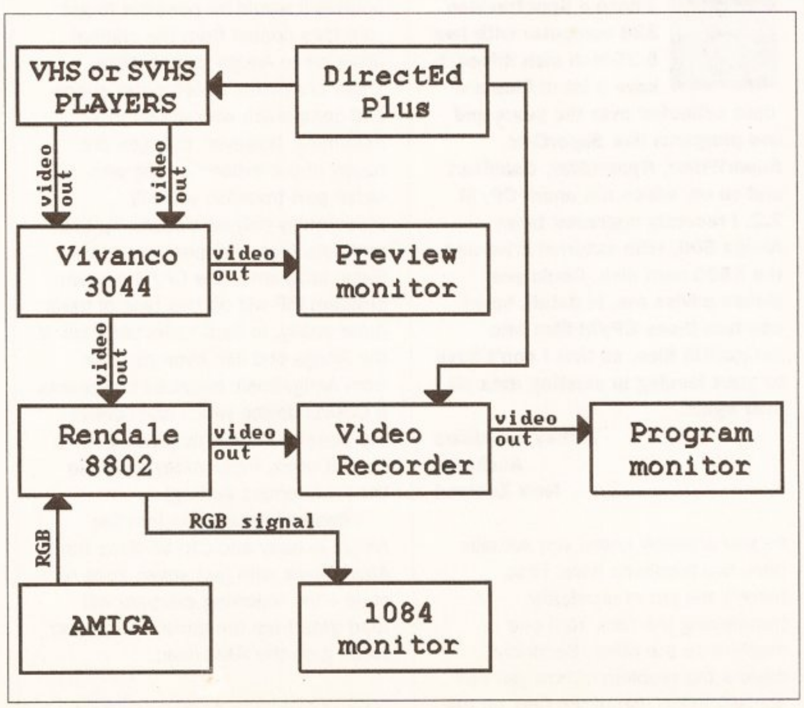
Connect up the computer and genlock, boot up and see if you get a stable Workbench screen. If so, then connect a composite video out from your VHS to the 8802's composite in and take the 8802's composite out to a monitor. Play the tape (as good a quality one as you've got) and check the quality. If all is OK so far, continue to try different combinations of equipment with the genlock until you either hit a problem – in which case you should then be able to isolate the fault – or your whole system is up and running well.

Below is a diagram to suggest how you might connect your system together for better performance.

Poor quality from a genlock is usually caused by feeding it with a poor quality signal. Since the genlock relies on the incoming video for its timing you must give it the best possible input. This will allow you to get the most stable locking possible under the circumstances. Of the current formats, VHS is arguably the worst quality. Additionally, there are graphics colours such as saturated reds and blues which will not look as good as lighter, pastel shades. This is partly to do with the Amiga itself – so experiment to find colour combinations which work best. Finally, expect some wobbling (known as 'chroma crawl') down the left hand side of your graphics – this can be a problem even with some of the best devices and is another product of the Amiga itself.

Hint: try to use hi-res Amiga images wherever possible, as these will be far crisper on screen then HAM or other resolutions.

If you run into further problems, call Rod at Marcam on ☎ 0604 790466. He assures me that he will try his best to solve your problems for you. ***GW***



Connecting the Amiga to a video system with a genlock.

JARGON BUSTING

Genlock – A way of slaving one video source to another (for example, an Amiga to a video tape recorder) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

Hard drive – Like a floppy drive, but much bigger (not physically, but in terms of storage capacity) and faster. Also, the disk from a hard drive cannot be removed, so once it has been filled it is either time to delete excess files or buy another drive.

BEGINNING BUSINESS



I am going self-employed, and my chosen field is (part-time) mail order. I would like to know what relevant software/hardware I will need to get started and also what upgrades and add-ons I will need as my business starts to grow.

I have been looking at various computers including the Amiga, with its excellent graphics for games, but there are many other makes and models including business computers. I don't have a clue about which one to choose. I have read magazines and contacted relevant computer companies but no-one seems to cater for the complete novice.

It seems that the Amiga A500 is the perfect choice to make a start in business, and your magazine has made me aware that is is much more than a computer to play games on; but how does it differ from other business machines?

Alex Baldwin
Thornaby
Cleveland

The Amiga is the perfect choice to start a small business. It stands to reason that if a computer has the power and sophistication to play great games, then to merely display accounts, calculate spreadsheets, record data and type letters should be well within its capabilities. This is even more relevant now. For people like myself, games have always been the spin-off of a really good computer but not its original intention. The fact remains that the Amiga can perform as well or better than most so-called business computers whilst multi-tasking (performing more than one action at a time) and displaying pleasing multi-coloured screens.

I hope that the above clears-up your worries that the Amiga is only a games machine; many business machines even now do not have the

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continued from page 51

facilities which are on offer to the Amiga owner.

Now the deep stuff begins. In order to run your business effectively, you will need a good database. This will enable you to keep records of customers' names and addresses. By using calculated fields you can keep track of their current balance. This is all very well, but you also need to despatch invoices and control stock flow. I would still suggest that you purchase a database, but you may find that a dedicated business program such as an accounts program would be more suitable.

A word processor is always a must, and frankly I can't see you requiring any more than good basic efficiency. You will not need the facilities to print in colour or even high resolution, a normal WYSIWYG (what you see is what you get) should suffice. For more information on word processors, see the in-depth feature on pages 15-32 of this issue.

The upgrades you will require as your business grows will depend upon the rate of growth and future potential. The first consideration should be to increase your available RAM. This is the internal memory available to the computer. Because the Amiga is a true multi-tasking machine, the ability to perform more than one task at a time will ultimately depend upon the amount of available memory to perform this function. Also, increasing the amount of RAM available will increase the size of the RAM disk (a pseudo-disk drive contained within the computer's memory). I would suggest a system with around 2 to 3Mb of RAM should be considered.

Then there is the question of disk drives. A single drive system is clumsy and awkward, because of the disk swaps that this configuration requires. You can buy an external 3.5-inch drive from any good computer stockist.

For any serious business use, in fact, you should seriously consider a hard disk drive. In most cases a drive of around 20-40Mb would be sufficient, but it is a wise precaution to allow for the maximum media storage from the beginning. Although you can upgrade as you go along, it is not always convenient to send the computer away to increase the hard disk capacity, especially when this could have been avoided from the outset. Therefore, I would suggest that you consider a large capacity drive – 40Mb upwards.

A monitor is also essential for business use, so be prepared to spend anything from £200-300 for a suitable medium- to high-resolution model. To cut the cost, a monochrome monitor which displays just two colours (black and white or green and black) should be available for about half the price – but then, of course, you will not have the superb colours that the Amiga is famous for.

Finally the printer. You get what you pay for with printers; the art is to find one that will suffice for the least possible cost. Laser printers, daisy-wheel and ink-jet printers all have their place. I would think that a good 9-pin dot-matrix printer would be sufficient for your purposes, and of course colour is entirely optional. We reviewed a number of printers in issue 4 of *Amiga Shopper* – back issues of the magazine are available from ☎ 0458 74011.

The costs quoted below are approximate and will obviously differ between suppliers:

Initial purchase:

Amiga A500	Around £350.00
Monitor	£250.00
9-pin printer	£185.00
40Mb hard disk drive	£300.00

Upgrades as required:

3.5-inch floppy drive	£60.00
2Mb RAM expansion	£200.00

MD

LISTING BREAKS

Because of the width of the magazine's columns, we occasionally have to break listings across two or more lines. Where this has occurred, and you should enter two or more lines without a [Return] between them, we have used the following symbol: ↵

CP/M TO DOS TRANSFER



I have a Spectravideo 328 computer with two 5.25-inch disk drives. I have a lot of files and data collected over the years and use programs like *SuperCalc*, *SuperWriter*, *ReportStar*, *CalcStart* and so on, which run under CP/M 2.2. I recently upgraded to an Amiga 500, with external drive and the A590 hard disk. Could you please advise me, in detail, how I can turn those CP/M files into AmigaDOS files, so that I don't have to start feeding in existing data all over again.

Jeffrey Kavelaars
Auckland
New Zealand

As you probably know, you actually have two problems here. First, there's the job of physically transferring the files from one machine to the other. Secondly there's the problem of how you can actually make use of the files on the new machine.

JARGON BUSTING

Baud – The number of possible changes in state per second on a transmission line. For simple modem protocols such as V.21 and V.22, there are only two possible states, so baud rate is equivalent to a measure of bits (binary digits) per second. V.32 makes use of many more clever coding techniques, so that more bits per second can be sent at the same baud rate.

Serial port – An interface port at the back of the Amiga, used mainly for connecting to a modem for communications purposes, and sometimes used for printers. Data is sent through the serial port one binary digit at a time (one eighth of the speed of the parallel port, which is the port more usually used for connecting to a printer).

Let's look at the file transfer problem first. The easiest solution is to link the two machines via their serial ports. I have no details of the Spectravideo machine, so I can't tell how the serial lead shoud be wired for high speed transfer but what I do know is that if you stick to a low transfer speed, namely 300 baud, you'll find that you will be able to moves files both to and from your Amiga by using a lead containing just three wires. Have a look in your respective machine manuals for the system-ground, transmit-data and receive-data serial port pin info (pins 7, 2, and 3 on the Amiga) and make up, or get a friend or the local computer shop to make up, a suitable lead. There are no dangerous currents involved, but wrong connection can easily damage the chips so if in doubt get help from someone who is used to playing around with electronics.

A lot of people are wary of hooking up serial ports like this, and there is an alternative: for a few pounds it would be possible to get your files copied from the original disks on to Amiga format disks. There are plenty of computer shops and companies who will do this. Assuming, however, that you are happy about experimenting with serial port transfer, you will presumably only be transfering text and data files plus perhaps some Basic programs. The CP/M system program PIP will do this type of thing quite easily. In fact, collecting files at the Amiga end can even be done from AmigaBasic because it supports a COM1: device which can control the serial port directly (when this is used it does, incidentally, override the Preferences setting).

Reading serial data into the Amiga is easy and can be done from AmigaBasic with just seven lines of code – the following example will read data from the serial device and place it on the RAM disk:

```
OPEN "RAM:text" FOR OUTPUT ↵
AS #1
OPEN "COM1:300,n,8,1" AS #2
X$="D"  'just a dummy value ↵
to get into loop
WHILE (ASC(X$)<>94) 'end of ↵
file terminator
   X$=INPUT$(1,#2):PRINT ↵
X$;:PRINT # 1,X$;:
WEND
CLOSE 1: CLOSE 2
```

This sort of scheme could be used to collect serial data from *any* other machine, and the only thing you need to be careful about in the above loop is the end-of-file terminator – that is, the character which signifies the end of the file – because this varies from system to system.

To transfer a file in this fashion you'd link the two machines with the serial lead, load up AmigaBasic and run the above program. Nothing visible will happen because the program just sits there waiting to collect serial data which, when the program first starts, is not being sent down the line.

The next step is to move across to your CP/M machine. In terms of detailed help I hit a minor snag here, because I no longer have much in the way of CP/M documentation available and my CP/M-literate days are over. Being a CP/M machine, your Spectravideo will have devices like LST implemented. You will probably need to configure your system so that this device is logically tied to the machine's serial port (which again must be set to 300 baud). STAT is the CP/M system program that will let carry out these type of assignments, and this will be documented in the CP/M sections of your computer manuals. Once the output device has been chosen you'll need to load up the PIP utility and issue a suitable PIP command. Again it's the CP/M manual sections that will contain the detailed options but the basic scenario will look something like this...

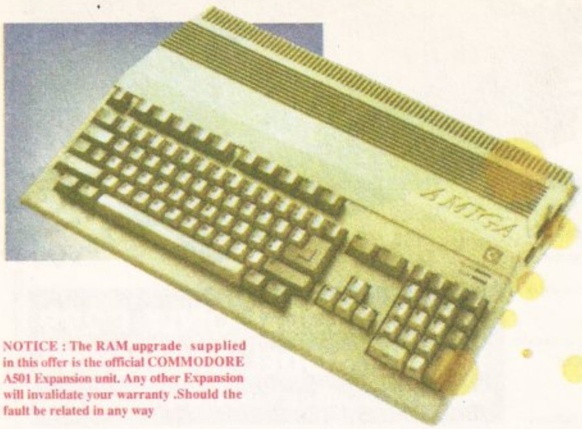
First you'll run PIP and be greeted with an asterisk prompt:

continued on page 57

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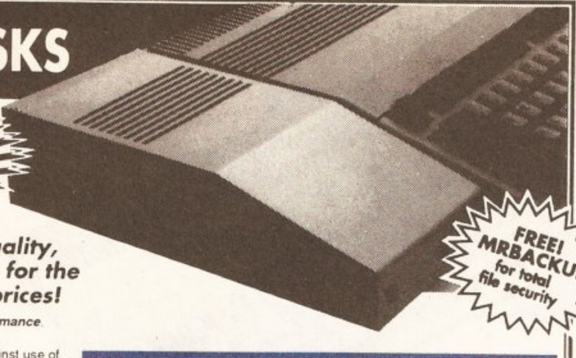
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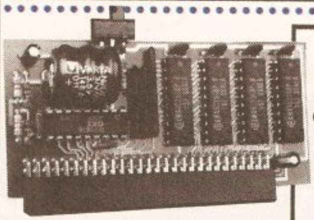


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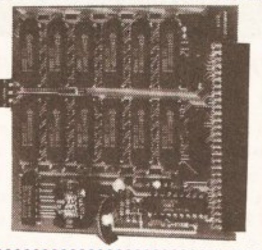
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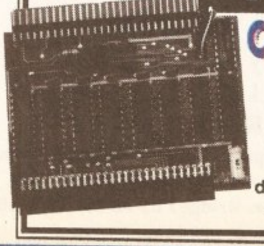
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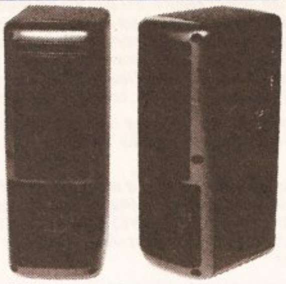
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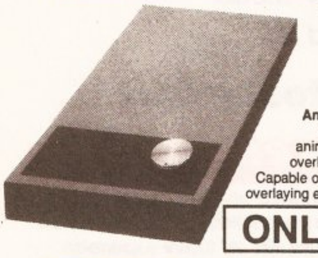


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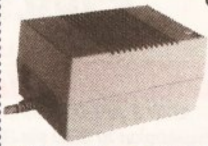
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The Zydec 1.5Mb upgrade board requires a connection to the Garry chip and Kickstart 1.3 installed. Includes clock.

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```
A>PIP
*
```

then you'll type something like:

```
LST:=B:example
```

which would copy the drive B: file 'example' to CP/M's LST device (which in turn will be redirecting the data to the Spectravideo serial port). It is at this time that you should see visible evidence of file transfer appear on the Amiga's screen.

Incidentally, before all this you can check the serial link by hitting [Control]-P (CP/M's echo to printer command) on your Spectravideo. From that point on, everything you type at the keyboard should appear on the Amiga screen. If the serial ports are properly configured but you don't seem to be reading anything then about the only thing that can be wrong is that the connections on pins 2 and 3 (the data transmit/receive lines) are the wrong way round. The solution is to just swap those two wires around at one end of the lead and try again.

You often get minor snags, but with all this comms magic a bit of experimentation usually saves the day. CP/M should, for instance, provide an end-of-file marker but if things appear to 'hang' at the end of the transfer, then the keyboard sequence [Ctrl]-P [Ctrl]-Z. [Ctrl]-P (which will echo a CP/M end-of-file character to the Amiga) should result in the AmigaBasic program giving its OK prompt. If all else fails, stop the AmigaBasic program and type 'CLOSE' to finish the Amiga side of the transfer.

Well, that's the general idea of the hack approach. With a more sophisticated lead that supported proper handshaking you would, of course, be able to increase the transmission rate, and here commercial CP/M comms programs such as *BSTAM* would be useful.

Text/data files are easy to handle in this way, and so are Basic programs, but to be of use these latter files must be available in ASCII format. It's easily done – you just save a copy of the program using the 'A' option like this...

```
SAVE "TESTPROGRAM",A
```

How much use you'll be able to make of the files you transfer depends on whether the files are going to make sense to the Amiga programs that use them – spreadsheets, databases and word-processor file formats vary from program to program and I'm not familiar with all the programs you mention. Many CP/M word processors used *WordStar*'s trick of setting bit 7 of characters to indicate soft spaces. If *SuperWriter* does this it might be best to clear these bits from the file during the PIP transfer. There's a special PIP [z] command option available for this.

Once you've got the serial link sorted out, check your existing Spectravideo software manuals looking for details of file formats, program options like 'export' and so on, which may allow some files to be output in a less program-specific form. Then send the new files over your serial link and try them out. **PAO**

UPGRADING RAM



I own an Amiga A500 with two external drives and 1.5Mb Zytec RAM upgrade board. I am thinking of buying an A590 hard drive. Is it possible to upgrade the A590 to its 2Mb RAM facility and still use my existing 1.5Mb upgrade? Can you also tell me how much it costs to add this 2Mb RAM, and if it is difficult to do?

Brian Crawley
Retford
Notts

The 1.5Mb expansion fits inside the trap-door of the A500, whereas the A590 hard drive is designed to fit easily to one side, so there are no physical problems fitting the equipment. I have spoken to Evesham Micros, which manufactures the expansion board in question, and I am assured that two will work in harmony, including the extra 2Mb RAM upgrade. The cost of the 2Mb RAM is around £100. **MD**

DELUXE MUSIC ENTRY



I have recently purchased the Electronic Arts package, *Deluxe Music Construction Kit*. It's a very good package but I would like help with some problems I have with it. I want to put music on to the score and can do so, but when I am composing music as it comes into my head I cannot enter it past the first measure (bar). Shouldn't it automatically jump to the next measure when the first is full? I find it very frustrating because by the time I have worked out what to do, the music has gone from my head.

Ian Dickie
Strathclyde
Scotland

The *Deluxe Music Construction Kit* has several methods of entering notes. If you enter them from a MIDI keyboard, the bars scroll by, filling up as you play them. If you click on 'Insert Notes in Score' and then 'play' them in from the on-screen keyboard, then although the display does not scroll the notes are still entered and when you play pack there they are, scrolling away before your eyes. Obviously, when you enter from the on-screen keyboard the notes will take their length and note value from that set in the program's note palette.

If, however, you drag them from the note palette directly, they behave exactly as you say; it would appear that you can't get past the first bar. The trick is to resize the score window so that it is at its maximum size. The rest of the score is actually below the first line you are working on so when you have filled the first line, don't carry on inserting notes (they won't sound on playback anyway). What you do is use the right-hand scroll bar of this window to pull yourself down the score; if you like, you are moving to a clean sheet of paper. In this way you will have an unlimited number of bars to enter notes in: the program realises that since you have pulled the score down you want to enter more notes. **JB**

CRASHING AMIGA



I seem to be in a spot of bother with my 1Mb Amiga 500. When I try to load various pieces of public domain software, mostly utilities, I find that the computer crashes and says it has a "Software Error – Guru Meditation". I took down the numbers. Please could you help me find out what the problem is, because it even crashes when I'm playing my full price games. The disks I used have not got any viruses on them, so this has left me baffled.

Anthony Sargant
Crawley
West Sussex

I'd be lying if I said I definitely knew the answer to your problem. The Amiga can crash for many different reasons. It could be that you have got a virus on your disks, but a newer one that your virus checker can't identify. I doubt this, though, because they would not cause the machine to crash when using most full-price games. I strongly suspect a hardware problem with either your machine or, more likely, the 512K RAM expansion in your trapdoor. Try removing the expansion and see if the machine crashes without it. **JR**

LEARNING ASSEMBLER



I will be buying the *Devpac 2* assembler soon, but do not know which book to buy. It has got to have simple pages which are easy to understand, not filled with jargon. Can you help?

J V Smith
Prettygate
Colchester

Unfortunately, learning machine code (indeed, most languages) on the Amiga is no simple task. Most books tend to break the process down into two parts: learning machine code and learning how to program the Amiga. Worse still, to properly learn how to program the Amiga you will eventually need the official Commodore reference manuals. There are four of them: *Hardware Reference Manual* ISBN 0 201 18157 6, *Includes and Autodocs* ISBN 0 201 18177 0, *Libraries and Devices* ISBN 0 201 18177 0 (all published by Addison Wesley), and the *AmigaDOS Manual* ISBN 0 553 35403 5 2495 (published by Bantam). They cost £20-30 each, and as they are written for programmers, they are full of jargon. The AmigaDOS guide has just been released in its third edition, and now caters for AmigaDOS versions up to 2.04. I'd recommend *Amiga Machine Language Programming* ISBN 1 5575502 5, published by Abacus for £14.95; it has got all you need to start off with. ***JR***

PRINTING PICS ON A PC



I have an Amiga 500 and would like prints from *Deluxe Paint III* IFF files and Notepad text files. I do not own a printer but

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JARGON BUSTING

Assembler – A program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine – but it's far harder than writing in, say, Basic.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesizers to be controlled by a single keyboard, sequencer or computer.

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I have access to an MS-DOS compatible PC with a dot-matrix printer. How can I convert an AmigaDOS disk with the above files on it to load and print on a PC?

Anon.

The first thing to note is that picture files from the two machines are incompatible. The standard format for the Amiga is IFF, whereas the IBM standard format is PCX.

Professionally written packages exist to convert from one format to the other, although I would suggest you approach your public domain library to purchase *IFF2PCX* for the Amiga, which is a shareware program. This is a brand new application, and at the time of going to press no major PD houses stock it, but both Amiganuts and Softville intend to do so. You can, of course, contact the author direct: John Shaw, 32 Lonsdale Drive, Toton, Nottingham NG9 6LS.

IFF2PCX will allow you to convert the file to IBM format, but you will also have to invest a disk transfer utilities so that you can transfer this file onto an IBM formatted disk. There is a program in the public domain called *MessyDOS* (Fish Disk 382) which should transfer the file adequately. ***MD***

DOTTY SCREEN



I have had a problem with my Amiga for nearly three years. About a year after purchasing the machine, the screen started to flash every time I hit a key, and pixels began to appear on the screen. I reset the machine to be greeted by a greatly corrupted disk prompt. When I tried to reboot, the drive would either continually spin or just spin a bit and then stop. Because it was an intermittent fault it was taken to the service centre three times before they discovered and cured it. They could not say what had been done. It has now started again.

Also, I have a Star LC10 colour printer. Whenever I print graphics from *Deluxe Paint*, they come out covered in lines. It appears that one line of print is a fraction too close to the one above it. I have tried all the settings in Preferences, including the custom page, but none make any difference. Can you help?

Don Homer
Halesowen
West Midlands

This wierd effect of random dots appearing all over the screen is simple to diagnose in general, but it is not always easy to track down the specific cause. The problem is simple, either the RAM chips are faulty or they are not being refreshed. DRAMs used in many computers need to be refreshed every couple of micro-seconds so the data they contain is not lost. When bits drop out because something has gone wrong, the result tends to manifest itself as random crashes and/or bits of garbage appearing like holes all over the screen.

My advice would be to first remove any RAM expansions you may have and see if that cures the problem. For instance, a faulty A501 clone could give rise to this type of fault. Failing that, get the machine checked over by an approved Commodore repair centre – and insist they repair it.

The lines you're seeing on graphics dumps are called banding. This effect is typical of almost all dot-matrix printers and is almost impossible to overcome. It is caused a small amount of play in the the feed mechanism. The best results can usually be obtained by using friction-fed as opposed to tractor-fed paper. Other than that, you'll just have to put up with this endemic problem – sorry. ***MS***

FINDING THE TIME



Amiga files have a datestamp on them consisting of the number of days since January 1st 1978. Is there a library routine which will convert to a more standard date (DD/MM/YY, YY/MM/DD and so on) to save me writing one? I am sure that there must be such a routine, since several commands such as LIST and DATE must do the conversion.

Alan Smith
Norwich

You're right… there ought to be one but, despite being an avid reader of both the *ROM Kernel Manuals*, the *AmigaDOS Manual* and many other Amiga technical publications, I've not come across any mention of any such beast. If it does exist it certainly isn't documented in the obvious places.

Despite this, if you are programming in C you haven't actually got a problem because both Manx's *Aztec C* and *SAS C* support a number of time functions. These include the standard ANSI time functions ctime() and gmtime() which, with possibly some minor adjustment for the zero date reference point, will do the conversions you need. I don't know, but I suppose that it is just possible that LIST and DATE were either written in C anyway or that the appropriate routines were 'borrowed' from a compiler library. ***PAO***

JARGON BUSTING

IFF – Interchangeable file format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It allows data to be exchanged between programs very easily and avoids the situation on, say, the PC, where dozens of different graphics packages each save data in incompatible formats.

ILBM – Interleaved bitmap is the IFF sub-format in which graphics images are stored.

SAVING FROM *SCRIBBLE*



I have the *Scribble* word processor system and an unexpanded A500. I have managed to save information to the *Scribble* disk, but am not able to save it to another disk for storage and subsequent recovery. It seems so basic, but can you help?

W Heys
Banstead
Surrey

Yes, the answer is as easy as you suspect. Select 'Save as' from the menu but when the requester appears, click on the box after the word 'Directory:' and clear it by typing [Amiga] X (that is, pressing the [Amiga] key and the X key at the same time). Then type in the name of the new disk that you wish to save on to, either DF0: for the first drive or DF1: for a second drive, or simply give the name of the disk, for example 'MyDisk:' – and don't forget the colon at the end.

Insert the disk you now wish to save to; if you have used the latter method then a requester will appear to prompt you to do this. Then give the file a name, press the [Return] key or select'Save'. Your new disk will now have your document saved on to it, and subsequent documents will be saved to this disk. **MD**

BECOMING FAMOUS



If I produced graphical animations on disk for the public domain, how will I get them into a public domain library?

Andrew Marshall

Simple, Andrew: just send your disk to any one or several of the PD houses. Include an SAE for the disk's return should the PD house decide that it doesn't want it, and also a short covering letter explaining that all the work on the disk is your own. It might also be an idea to include a short doc file on the disk, describing your good self and your animation. Instead of mailing it, you could compact the whole lot using one of the popular PD archiving programs and upload the file to a bulletin board or two. **CR**

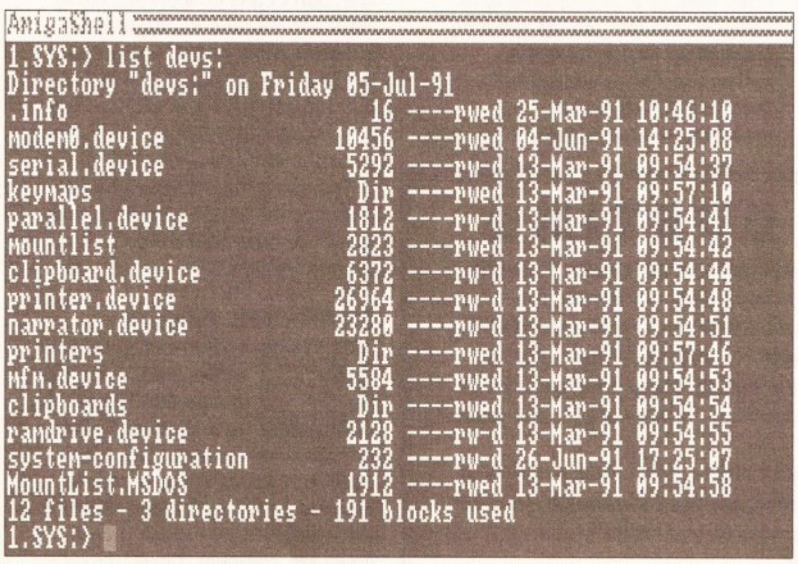
GRAPHICS CONVERSIONS



I am looking for a program in the public domain which will either show GIF files or which will convert GIF files to IFF ILBM. Can you help?

D Evans
Ilford
Essex

There are a number of graphics file conversion programs in the public



Just how does the Amiga translate its dates into a sensible format…?

domain, such as *IFF2GIF* (Amiganuts Disk 793) but the preferred way to do this sort of thing in my book is *Art Department* (£69.95) or *Art Department Professional* (£163.43) by ASDG, distributed in this country by HB Marketing (☎ 0753 686000) and Silica Shop (☎ 081-390 1111). These programs convert pretty much anything to anything, and the files are preserved in their original aspect ratios, which you can't do using the PD programs. The big drawback with the PD programs is that they are NTSC, and so only process 200 lines. As most GIF files are converted from 350 line VGA or EGA images, you only get part of the picture. **PS**

'MALLOC' PROBLEM

When using malloc() I made the following error. I typed something like the following:

```
if(!(IPPPtr=(struct IntuiPri↵
nt *)malloc(sizeof(         ↵
Intuiprint)))) return(NULL);
```

The error is a typo, with the word Intuiprint being typed instead of IntuiPrint. Now malloc returned a NULL because there was no such structure as Intuiprint, and the program caught the NULL and flagged an error. But the compiler failed to warn me at compile time that I was trying to allocate memory to a structure it had never heard of. Would you expect the compiler to do this?

Also, am I right in assuming that if I use the 'malloc' statement within a function, typically to allocate memory for a structure, then any values I stick in it will hold good and can be accessed from other functions provided I have passed back a pointer to the structure? In other words, is using malloc to make space for variables effectively equivalent to making global variables, in the sense that the values are not destroyed when the program exits from the function involved?

Alun Evans
Ynysforgan
Swansea

The short answer to the first question is yes and no. In theory all such errors should be caught by the compiler and this particular slip, namely the use of an undefined structure identifier, is certainly easily caught by the current Lattice and SAS compilers. In general, however, it is not that uncommon to find that errors like this do get missed by compilers, especially when they are parsing fairly deeply nested expressions. This might have been a problem with version 3 of Lattice C, but since I no longer have that version I'm not able to check.

Now for your malloc() query. Once you've used malloc() to allocate memory, that memory is yours, and remains allocated until you choose to give it back to the system by using a corresponding 'free()' call. Consequently, whatever data you place into that memory space will also remain there until either you alter it or explicitly free the memory.

This, thank goodness, is *not* the same as making an equivalent global declaration, and even though the data is there it does not necessarily mean that it can be accessed. The bottom line is this: the scope, ie the visibility, of your malloc() data depends essentially on the visibility of the pointer used to access the memory block. If the pointer used to store the address of the allocated memory block is declared as a global then the allocation becomes effectively global. If the declaration was local then the visibility of the data will be restricted as per the usual rules for local variables.

In the following fragment of code, the variable g_intuitext_p, because it is declared outside of main(), can be accessed from anywhere in the program – even from within other functions:

```
struct IntuiText            ↵
*g_intuitext_p;
main()
{
if (g_intuitext_p=malloc    ↵
(sizeof(struct IntuiText)))
   {
   /* allocation successful
and the g_intuitext_p pointer
can be used anywhere within
the program as a global
variable. It can therefore be
used by the following
function... */
   SomeFunction();
   free(g_intuitext_p);
   }
}

void SomeFunction(void)
{
/* this function can use the
malloc() data associated with
g_intuitext_p. In this sense
the data is global */
}
```

If, however, the pointer declaration was local, then the pointer – and therefore its associated memory block – would only be visible within the function that declared it. If another routine wished to use that data you'd need to explicitly pass a copy of the pointer (or its address) as a parameter, like this:

```
main()
{
struct IntuiText            ↵
*intuitext_p; /* local
variable */
if (intuitext_p=malloc      ↵
(sizeof(struct IntuiText)))
   {
   /* allocation successful
but the intuitext_p pointer
will not be known to
functions outside of main()
*/
   SomeFunction(intuitext_p);
/* pointer has to be
explicitly passed before
function can use the malloc()
data */
   free(intuitext_p);
   }
}
```

In general, then, the scope and visibility of the malloc()-created data blocks will depend solely on the scope and visibility of the associated pointer. **PAO**

JARGON BUSTING

Compiler – A program providing a means of translating another program, written in a high-level language (such as C or Basic) into machine code which is understandable by the computer.

Malloc – A function in the C programming language which requests a chunk of contiguous memory from Exec. If the amount of memory requested is available, the function returns a pointer to the beginning of this memory. If not, the function returns NULL.

Parse– The second stage that a compiler goes through when translating a high-level program. It checks that the components of its input (program statements and so forth) are consistent with its pre-defined set of syntactical rules. In other words, it checks for errors like uneven numbers of right and left brackets.

AMIGADOS TROUBLES

Following the instructions in the AmigaDOS tutorial if issue two, I ran into the following problems:

Having typed the relevant command for formatting, the reply 'Drive not found' keeps appearing. Also, having typed the command for disk copying, the reply 'Error on SOURCE disk. Cannot open AmigaDOS device' keeps appearing.

The above problems also occur when the original Workbench disk is in the drive. Is my disk corrupt? If so, is there anything I can do to overcome these problems?

R G Alldis
Southampton
Hants

The answer to this one is really very simple: you are typing the command's synopsis, not the command. Take the command 'FORMAT', for example: it has a synopsis of FORMAT <drive> NAME <name> [NOICONS] [QUICK] [FFSINOFFS]. This means that you replace the word <drive> with the drive number you want to format, and replace <name> with the name of the disk. In other word the command line you enter looks like this:

```
format drive df0: name empty
```

You have been entering the synopsis directly like this:

```
format drive <drive> name   ↵
<name>
```

At which point AmigaDOS looks for a drive called <drive>, decides there isn't one and reports an error. Much the same applies to the DISKCOPY – try it for yourself. Any experts who find this highly amusing should try thinking back – not so funny now, is

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I SEE NO TIPS

Don't need our help? Reckon you can do a better job of giving advice and tips? Well, do it! As well as asking for advice, we want you to give it, too. If you have discovered a useful tip for any program, hardware, language or whatever, send it to us and if it's any good we will use it on the Amiga Answers pages and bung you £5 in return. If you think we have got an answer wrong, or haven't given the full picture, give us what you think is the right answer – we might even cough up some cash for that too. So don't just sit there, get tipping and help out your fellow Amiga owners. Send your cunning tips to: Amiga Tips, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

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it? Don't worry too much, RG, AmigaDOS is a minfield until you get used to it. ***MS***

PAYING BY PHONE



I pay all my bills by phone, that is by phoning the TSB central computer and, when the call is answered, switching over to the beep tone on the dialling pad and then make the appropriate beeps to the questions asked. Can I do this using my Amiga 1500?

P B Blake
Hinckley
Leicestershire

There are, indeed, programs which emulate a touch-tone telephone by playing the tones through the Amiga's audio channels. Unfortunately, these require you to hold the telephone receiver close to the monitor speaker, which I'm sure you will agree is considerably more bother than using the telephone's keypad.

The computer-generated voice replies given by these services cannot be converted back to computer-readable data. Only the Bank of Scotland offers an on-line service with its Home Banking system (known, I think, as HOBS).

Strangely enough, the designers of the Amiga built a similar idea to yours into the hardware. The serial port still carries audio pass-through lines, allowing telephone speech to be routed through the monitor. No external hardware has ever supported it, though, and probably wouldn't gain BABT approval even if it did. ***SCR***

NOTEPAD PRINTING



I use the *Notepad* utility to print letters to my Star LC10 printer. The problem is that a full blank line is printed at the point at which *Notepad* starts to scroll its display. The text then continues printing out without anything missing. Is there a way around this problem?

Peter Walsh
Fareham
Hants

I think that this could well be another one of the many bugs found in *NotePad*. Peronally, I use *ED* or *MicroEmacs* (from the extras disk). Since you are using a Star LC-10, you could try setting the Preferences Printer setting to 'letter quality' (as opposed to draft) and printing in draft from *NotePad*. This will cause *NotePad* to send just ASCII characters to the printer device; but the printer will get switched into NLQ mode. Unfortunately, doing this means that you won't have access to fancy fonts. On the other hand, you should get good quality, business-like output. Moreover, it'll also be a lot faster!

If you are thinking of upgrading from *Notepad* to a 'real' word processor, make sure that you check out our major feature this issue, which starts on page 15. ***MS***

WHAT IS AREXX?



I own a copy of the *Advantage* spreadsheet and I'm very pleased with it. There are still things I'd like to be able to do, though. The manual suggests that ARexx is the way forward...

I've read a little about it, but the most useful thing I've found out so far is that it's pronounced 'A-Rex-Ex'. I've not seen it advertised anywhere, either.

Can you tell me more, please? I'd like to know if I could use it with my 1Mb 1.3 A500, where to get it, what it could do for me, what it would cost to buy and whether you have any useful pointers you can give about using it. Would it be of use for other applications too?

Roy G Ayres
Eltham
London

ARexx is an interprocess communications protocol. What this means in English is that it provides a means for any program or script file to take over control of another program that is running. For example, you could write a script to extract data from your spreadsheet and incoporate it into a word processor, like *ProWrite 3.0* or any other which supports ARexx.

ARexx will be included free with the upgrade to Workbench and Kickstart 2.0, although this may still be several months away. In the meantime you can purchase ARexx and run it on your machine if you want to. It's better to use ARexx with a hard disk, although it's not absolutely essential.

ARexx is available from most suppliers (for example, Almathera Systems ☎ 081-683 6418). It costs £45.99. ARexx is only of real benefit for applications that have an ARexx communications port. Try and make sure that the applications software you buy has one; in the future this will become increasingly important as more and more applications are designed to run ARexx. ***JR***

READING THE KEYBOARD



I have programmed a sprite so that it can be moved by one pixel in any of four directions on the screen. I have not got a joystick so I was hoping to control the movement by the keyboard (Q, A, O and P keys for left, right, up and down respectively).

I have disabled multi-tasking because I will be accessing and controlling the hardware directly. This rules out the possibility of using the DOS libraries to read the keyboard. It would not be desirable to do it this way as I would have to open a CON: or RAW: window.

The question is, how do I read which keys are being pressed by directly accessing the hardware (CIA I think)? It seems that register $bfec01 is used for such a purpose but I am having difficulty in checking for keycodes being sent to this register from the keyboard.

F Chan
St. Helens
Merseyside

You are certainly right about it being possible to read keyboard data from CIA $bfec01, but unfortunately it isn't quite as simple as it might at first appear.

Disabling multi-tasking, and here I presume you mean using Forbid() to prevent task switching, doesn't really help in this instance because your problem has little to do with what other processes might be doing – in all probability they would be using more conventional approaches to keycode collection anyway. Your potential interference comes from Exec's interrupt jobs, namely the keyboard device's character collection routine. Unfortunately it's not even a case of locking out Exec by suspending interrupts for a short period with Disable() and Enable() calls, since the character collection arrangement is interrupt driven.

The Amiga keyboard, as I'm sure you know, is intelligent in the sense that it has its own processor which handles the job of reading the keyboard and returning complete keycodes to the Amiga. The keyboard transmits 8-bit data serially to the 8250 CIA, and when character reception is complete the 8250 itself then generates an interrupt.

If you want to reliably read the keyboard at this level you are going to have to synchronize your $bfec01 reads to the 8250 interrupt and this means adding additional interrupt code into the server chain. Details of how this are done are quite lengthy but it is dealt with in the Exec Interrupt chapter of the *Libraries and Devices ROM Kernel Manual*. You will also need to make sure that the priority of your interrupt code is high enough to ensure that your routine gets executed first.

At a higher level, another alternative would be to open the keyboard device yourself and get keycode data from that. You don't say exactly what you are doing but presumably the input device, which is started when the system boots, is still operational. Now, to be honest it is not advisable to read events from the keyboard device when the input device is active (because the input device then gets deprived of events which, in theory at least, it should have control over). Adding a high-priority keyboard reading routine to the interrupt server chain while the input device is active is regarded by many as being equally anti-social!

Is it really necessary? If your only interest is in detecting keypresses, then surely the more conventional

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JARGON BUSTING

CIA – The complex interface adaptor, which controls the two user-programmable input/output ports. They are used to control the serial and parallel ports, the keyboard and the disk drives.

CON – This is an AmigaDOS device which accepts text input and produces text output in a window. Key-presses are filtered to allow editing, and nothing is sent to the program whose window it is until the user presses [Return]. An example is the CLI window.

DOS – Disk operating system. On the Amiga, this acronym is better used as 'device operating system', since AmigaDOS controls more than just disks.

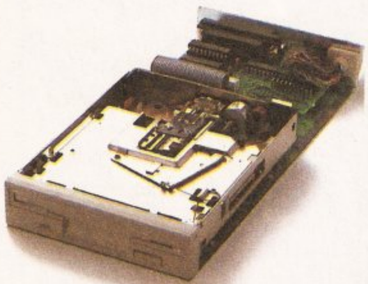
Multi-tasking – The ability of a computer to run more than one program at once. In practice, only one program is run at a atime, with the others waiting their turn. The part of the Amiga's operating system called Exec handles the switching between programs, which is done so quickly that they all appear to be running simultaneously.

RAW – An AmigaDOS device similar to CON, but without the translation functions which allow line editing to tak place.

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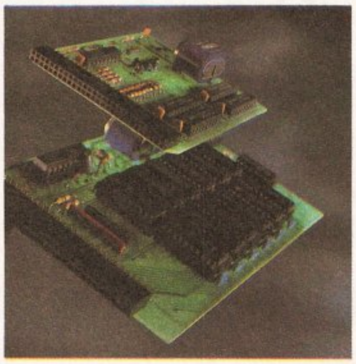
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GENERAL

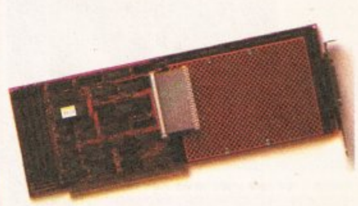
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approach, such as using an IDCMP port, would be better, easier... and you wouldn't need to interfere with the conventional multi-tasking Amiga environment. ***PAO***

AMIGA COMPATIBILITY



I am about to buy an Amiga for business and games purposes. I can get a good deal on an A2000, and was wondering whether all Amiga games that run on the A500 will run on the A2000. I am also unsure as to whether I shouldn't just get an A500. Could you please advise on what the advantages and disadvantages are of purchasing an A2000 over an A500?

Paul White
Marchmont
Edinburgh

Most Amiga A500 games run on an Amiga A2000; the ones that don't (and there are very few) are due to the extra memory configuration of the A2000 or the fact that some games are designed to take advantage of the 60Hz Fatter Agnus chip. In short, you should have very few problems in terms of program compatibility.

The real crux of your question as to whether it is worth paying the extra for an Amiga A2000 does not merit a simple reply. In days of yore, the A2000 was regarded as desirable because of its expandability. Now, all the expansion facilities such as PC emulation, expanded memory, hard disk drives and much more are available for the A500. If I thought that it would all end somewhere then I could say "get yourself an A2000", but I don't know where it will end, if ever.

The Amiga A2000 is designed as a workhorse, specifically with expansion in mind. It has a larger power supply and a cooling fan built-in. Expanding the Amiga A2000 involves simply purchasing the relevant PCB, opening the lid and plugging it in. The A500 was not designed for this purpose, although some staggering feats have been achieved using the serial port, through ports and even the clock/calendar trapdoor.

The crowning glory of the A2000 is that a bridgeboard can be inserted, giving almost total PC compatibility. The plethora of business software available for the PC can then be run within the Amiga's own multi-tasking environment. The A500 can have PC compatibility, but multi-tasking while running the emulator software is often limited.

Memory expansion is also fairly limited on the A500, whereas with the A2000 there are positively oodles of places to plug in your RAM chips, from purpose-built boards and the bridgeboard to hard disk controller cards.

I had thought about a table of advantages versus disadvantages for each computer but the results were so similar it seemed a bit pointless; suffice it to say that you must simply weigh up whether you wish to pay the extra money for an A2000, when the majority of its features are available to A500 owners. ***MD***

PRINTER CARTRIDGES



I recently bought a Commodore MPS 1270 Inkjet printer and I am having trouble finding a stockist for a replacement printhead cartridge. Do you know a stockist for a Kodak Diconix printhead or an equivalent, and how much it costs?

Bill Bennett
Yate
Bristol

This printer is not currently being manufactured, so spares and accessories will be difficult to find. You will have to order a special stock from the following supplier:

CPC PLC (Sales Department)
PO Box 158
Preston
Lancs PR1 1YJ
☎ 0772 555034

MD

EDITING ICONS



I recently bought a PD disk called *The Ultimate Icon Collection*, which includes *Icon Master* and *Icon Meister*. I have replaced *Icon Ed* on the Workbench with *Icon Meister* as the documents instructed. Then I tried to use some of the example icons that come with the disk to make my own icons.

When I re-open Workbench to see the new icons I get one of two results. Sometimes the new icon does not appear and the old one has gone too. The *Icon Meister* window reads, 'error: not enough memory for iconbuff.ptrz'. Alternatively, sometimes the new icon does appear but when I click on it twice a message appears, saying 'error while opening icon'. Why is this?

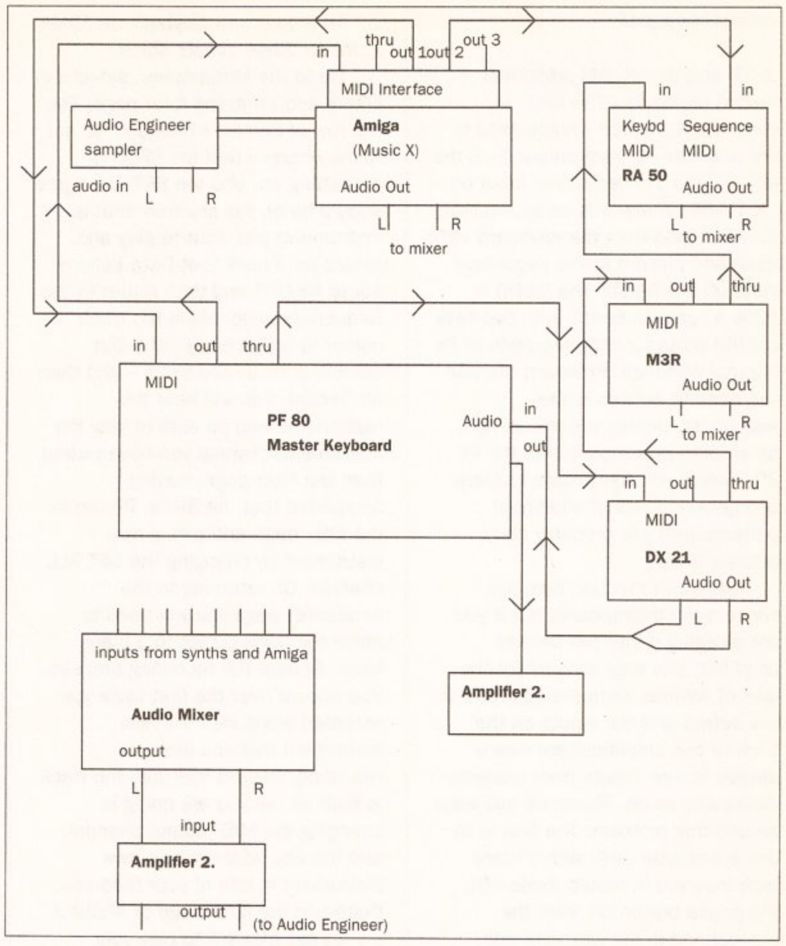
M Smithers
Swindon
Wiltshire

Of the two programs I would recommend using *Icon Master*, as the *Icon Meister* program is not as good in my opinion. Regarding your problem, you may have assigned the wrong icon type to the icon. There are a number of types for icons: disk icons, project icons, tool icons and trash icons. If the icon is set to be one type and the file is of another type, clicking the icon will give you an error. A project is a file produced by a tool or program. A tool is a program. A disk icon is the file 'disk.info' which is the image of the disk itself on the Workbench. The trashcan icon is a trash type icon. ***PS***

JARGON BUSTING

Exec – The part of the Amiga's operating system dealing with basic functions such as the allocation of memory to programs and the handling of multi-tasking.

IDCMP – This is short for 'Intuition direct communications message port', which is the mechanism by which mouse commands to control windows (close, open, re-size and so on) are transmitted to the program controlling the relevant window.



Ked Ward's rather comprehensive MIDI setup (see letter below).

CONNECTING TO MIDI



I don't know whether I'm a bit dim or what, but trying to understand MIDI and music to me is like watching paint dry. I'm getting nowhere fast. I have the following equipment: Amiga 1500 with 3Mb, Yamaha PF80 piano, Yamaha DX21 synth, Roland RA-50, Korg M3R, a 6 into 2 mixer, two amplifiers, MIDI interface with 3 outs, *Audio Engineer* and *Music X*. They are wired up as shown in the illustration above.

Am I connected up correctly? How do I record on different channels on *Music X* and play them back together in sequence? I can get a sample of my voice on *Audio Engineer* but I have to be extremely close to the microphone and with the volume up, and I can't get a line-out signal from the second amp. How do I use a sample from *Audio Engineer* on *Music X*? Could I get my PF80 or DX21 to play back a sample, for instance?

Ken Ward
Pitses
Oldham

You do not state what MIDI interface you have but I would guess that it is one where the outs are parallel; in other words they all run channels 1

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to 16 and do not add additional 'export channels'. The first connection you don't really need is the one running from output 2 on the interface to the sequencer input on the RA-50. Throw this away and take the MIDI lead from the keyboard MIDI input and place it in the sequencer input on the RA-50. The RA-50 is quite a complex beast, with two sets of MIDI ports for different parts of its internal workings. However, the part you need to access is the sequencer, unless you are using it as an auto accompanist for the PF 80 – which will complicate matters and generate lots of additional patterns that you probably don't actually need.

You don't mention how you connect the microphone, but if you are plugging it into the second amplifier, this may account for the lack of volume. Microphones have a low output and the inputs on the back of hi-fi amplifiers are nearly always for line inputs from cassette decks and so on. There are two ways around this problem. The first is to use a cassette deck with a blank tape inserted in record mode with the pause button on. With the microphone in the cassette mic input, the signal will be pre-amplified and routed from the cassette deck to the amplifier and then to the sampler. But the easiest and probably the best solution is simply to plug it directly into *Audio Engineer*, making sure that you flick the switch from line to mic on the front panel. If the result is still very low then I can only suggest that the microphone is the wrong type for one reason or another; either it is a dud or it requires external power. If in doubt, wave it under the nose of a specialist hi-fi shop (not your average high street electronic chain store, please!). Without actually seeing the amplifier and knowing how it works I can't really suggest why you are not getting a line out signal from it. However, you should run the usual checks on leads or swap amplifiers so as to isolate the problem.

The set-up you have is quite comprehensive. The thing to do is to set MIDI channels for each instrument. I would suggest that we start with the RA-50 and carry on from there: RA-50 channels 2-10 (10 is the drum channel – these are fixed anyway), PF80 Channel 1 (as it is the master keyboard), DX21 Channel 11 (it only works on one channel anyway), M3R Channels 12-16 only.

In this way you have covered all channels. The only outputting keyboard is the PF80, and it doesn't really matter what channel it goes out on as the software will alter the outgoing information.

To record and playback on *Music X*, follow these simple steps:

Go to the Mode menu, select Set Filters and enter the filter page. The top row of numbers needs to be set to the channel that the PF80 is outputting on, and the SET ALL figure should be on the channel (that is, instrument) you want to play and record on. Check that Data Echo is set to RE-OUT and then return to the Sequencer page. Move the track cursor to a free track – the Out column should read Ext 1 – and then hit Record. You will hear the metronome and be able to play the instrument/channel you have picked from the filter page. Having completed that, hit Store. Return to the filter page and pick a new instrument by changing the SET ALL channel. On returning to the sequencer page you will need to move the track cursor to a blank track. Repeat the recording process. You should hear the first track you recorded along with the new instrument that you are now recording. Repeat this until the track is built up. All you are doing is changing the MIDI output channel, and thereby addressing a new instrument in one of your modules, thanks to the filter page of *Music X*.

To get *Music X* to play your samples you will need to save the samples made with *Audio Engineer* in IFF format. *Music X* can then load and play them on a separate track, changing Ext 1 to Int and choosing the sound you want. *Music X* has a page especially for editing and organising samples.

The direct answer to the last part of your question is that you can't put samples directly in the PF80 or the DX21. However, you can play them back using the PF80 as the master keyboard and *Music X* as described above. The sound will come from the Amiga audio sockets. ***JB***

UPGRADING RAM



I would like to upgrade my Amiga by a further 2Mb because I use my machine mainly for graphics and ray tracing.

I have an Amiga 500 (in a Checkmate case), 1Mb Fatter Agnus upgrade, 0.5Mb RAM on the motherboard and 0.5Mb RAM in the trapdoor (configured at $000e8e - $0fe7ff, giving 1Mb of Chip RAM), and an A590 20Mb hard drive with 2Mb of RAM (configured at $200000 - $3fffff giving 2Mb of DMA Fast RAM). This gives a total of 3Mb of RAM.

My question is, which RAM upgrade will work with my memory configuration? I thought of buying Supra's 500RX, which will give me the 2Mb I'm after and enable me in the future to add further RAM. I've also thought about Cortex's RAM expansion. Both devices would enable me to use the through port to connect to my A590 hard drive, but the question remains: will the extra RAM configure as Fast RAM? Will it be compatible with my DMA RAM in the A590?

Andy Wilkinson
Lytham St Annes
Lancashire

The simple answer is yes, both the Supra RX and the Cortex expansion are true autoconfiguring memory devices, so both will allow you to add up to 6Mb of extra DMA RAM to your system with no compatability problems. Once the card is installed you should run *MergeMem* in your s:startup-sequence file to merge the two memory expansions into one contiguous block of memory. ***JR***

AMIGA CAD



I have an Amiga 500 with 1Mb RAM and was wondering what the best CAD package available at a reasonable price is, and also what printer I would need to reproduce a reasonable working drawing with, as it will mainly be used for college projects. Also, what sort of memory upgrade would be needed to run the program?

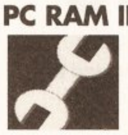
P Sloper
Salisbury
Wiltshire

X-Cad Designer from AVT (☎ 081-892 3637) is what you want. At £99 it isn't the cheapest, but it is extremely fast and has a very high specification. It is distributed by, amongst others, Power Computing (☎ 0234 843388) and HB Marketing (☎ 0753 686000). A plain 9-pin Epson-compatible printer produces surprisingly good quality output, but the output on a 24-pin Epson compatible (such as the NEC P20) really is superb.

You might wish to investigate a wide carriage printer, since these can generally take A3 paper. Although A4 works, A3 is the smallest size for really useful plots.

X-Cad Designer works well in 1Mb, although two disk drives make life easier. More memory is always useful, but your current setup sounds fine. ***SCR***

PC RAM IN AN AMIGA



I recently purchased, for a bargain price, a 4Mb memory expansion for a Compaq computer. Obviously this is not suitable for the Amiga, but I was hoping I could transfer the chips to an Amiga expansion board.

The board is populated with these chips: TC511000AP-10. If these chips can be utilised, could you please recommend a suitable expansion board?

David Williams
Stanwell
Middlesex

The chips on the board are 1Mb x 1 100ns chips. In theory these can be used; most Amiga 2000 cards use 1Mb x 1 chips. However, there are a few problems. First, recent Compaq memory cards use surface mounted memory chips. These look like small square blocks with pins on each side, soldered directly to the circuit board. These are not removable and can't be used with the Amiga. If the chips are socketed they are likely to be one of two types: DIP type are standard chip-shape with a row of pins along each side; ZIP are newer chips which stand side-on with all the pins along one edge.

The only board I know of for the Amiga 500 that will take 1Mb x 1 DIP chips is the Spirit X-RAM expansion, although I don't know of anyone who is still supplying this.

As for ZIP chips, I haven't found anything that will use 1Mb x 1 ZIPs. All the expansions using ZIP chips take the 256 x 4 ZIP instead. ***JR***

NOTATING MUSIC



I am a keen musician and, since I write lots of music, I would appreciate the help of my Amiga. Unfortunately I don't have any suitable software because commercial products are either two expensive or they give 99 per cent attention to MIDI and 1 per cent to music notation printing. I am an acoustic instrumentalist and don't have the facilities to do justice to a £200 MIDI/music package. My real requirement is the ability to print sheet music. Is there a program that will do just this, or would it be possible for me to write my own?

Steve Wilson
Salford
Greater Manchester

Your letter echoes the anxieties of most musicians who are involved with both music and the Amiga. The simple fact of the matter is that Amiga notation software is still thin on the ground, and packages which are good are reasonably expensive. The reasons are numerous: score writing, analysing and printing has proved to be a surprisingly difficult computing problem to solve. Up until fairly recently it was also a fairly specialised area and the small potential market had limited the interest of the Amiga-orientated music software companies.

I'm sure you've already heard of Dr T's *Copyist* program, but you might not be aware that more than

one version exists. The top of the range *Copyist DTP* retails at over £300 but there is budget version, called *Copyist Apprentice*, which retails for around £99. The *Apprentice* can handle 16-stave notation, is aimed at the dot-matrix printer user, and has had several enhancements since it first appeared. I think that it would be worth having a look at *Apprentice* to see whether it would be suitable. Talk to Zone Distribution (☎ 081-766 6564), which is now the main Dr T agent in this country.

As far as the possibility of writing your own program is concerned the chances, to be honest, are slim. I wouldn't like to have to do it, and nor would any of my MIDI/music-mad associates. Sure, it would be an interesting project to get involved in, but it would take an immense amount of time and this is probably the reason that the Amiga public domain world is virtually devoid of such programs! Unless you intended to market the final program, this 'do it yourself' approach would just not be a viable option.

Don't believe me? Check out the *Apprentice*, work out how many hours of your time is worth £99, and then estimate how much progress towards writing such a program you'd make in that amount of time. My guess is that anyone who tried such an exercise would barely be able to scratch the surface of the problem before it became an uneconomical idea. ***PAO***

USING A MAC HARD DISK

I have been give the option to purchase a 20Mb Macintosh hard drive fairly cheaply. Is there any way that I can connect it to my 1Mb Amiga 500?

If it is possible to connect it, will there be any problems with autobooting and software compatibility?

J C O'Shea
Killarney
Republic of Ireland

Macintosh drives use the standard SCSI interface, so yes, you can connect it. You will need to purchase a hard drive interface for your Amiga 500. The cheapest interface you can use is the Dataflyer (£129.95), but any SCSI interface for the Amiga will work. As long as you are using Kickstart 1.3 you will have no problems with autobooting. You shouldn't have any special problems with software compatibility either. Some software will refuse to work with any hard disk, but that's because the software was badly written and isn't the fault of your new hardware. **JR**

PRINTING FROM DPAINT

How can I leave the background white and print drawings in colour from *Deluxe Paint III*? Normally, with a white background the printer prints dots all over the page. I have a Star LC24-200 printer.

P B Blake
Hinckley
Leicestershire

The answer to your question is that it shouldn't. Although I have been unable to recreate your problem I assume your white background is not as white as it looks. For instance, have you checked the RGB settings in the pallette? For a full white R, G and B should be set to maximum. Failing that, try setting the colour correction in the printer preferences OFF. If any other readers are having similar problems – or know if a solution – I would like to hear from them. ***MS***

USING ICONX

I have written an AmigaDOS script file to check the amount of Chip and Fast RAM present in my system.

I have given my script file an icon and used *IconX* so that I can load it from the Workbench. Here is the program:

```
AVAIL
ASK "Press Return"
ENDCLI
```

The problem is that when it loads up, the *IconX* window appears, stays on screen for about two seconds and then disappears. If I use the 'Tool Types' requester to set a long delay, it ignores my [Return] presses and disappears after the specified time delay. What am I doing wrong? I want the window to appear when I double-click its icon, and go away on cue, at my [Return] key command, just like a normal script file. Also, can you tell me how I change the window's size and title?

Kenneth Kilfedder
Ballymena
Co. Antrim

You have managed to find a peculiar bug in *IconX* (one of a number, as a matter of fact). The ASK command just does not seem to work from an *IconX*-launched script. The way around it is to make the first line of your script:

```
.KEY DUMMY
```

This makes the script expect a parameter to be passed to it; not that a parameter is actually going to get passed, but it seems to make the ASK command work.

To change the window's size and title you must make another entry in the Tool Types requester of the Info menu. Enter:

```
WINDOW=CON:0/0/500/200/        ↵
Through the round window
```

The first word must be in upper case. The four numbers following CON: represent the window's top left corner and width and height; after these comes the window's title. ***CR***

WHAT VIDEO SETUP?

Later this year I plan to dabble in the world of desktop video. I already own a 1Mb Amiga, extra disk drive, 1084S monitor and *Deluxe Paint III*. I also have an Amstrad Double Decker VCR, a Sony video with steady pause and a Panasonic M90 video camera.

I would like your advice on several things.

1. I require a good quality genlock. Please name one. Alternatively, do you think the G2 Video Center would be a better bet?

2. Can all software run on any genlock? If so, what would you recommend for overall video production?

3. Will an A590 fitted with 2Mb be sufficient for serious video applications?

4. Can you recommend a reasonable videotape editor which will allow me to edit my tapes and add music and sound effects to them?

5. I also require a colour digitiser. Would DigiView fit my bill, or does any other come to mind?

My affordable price range is £500-800 for the genlock, £300 for software, £500 for the editor and £300 for the digitiser.

J McDermid
Glasgow

I dug out a few copies of the trade mags and put on my thinking cap, and here are a few ideas for you. But please understand that this list of answers is by no means exhaustive, and that my knowledge is not encyclopaedic.

1. As this question appears to be tied up with question 4 I feel I cannot give you a straight "Buy this one" answer. I would say that if you want a vision mixer then you would only require a simple genlock – no effects, no wipes, as these will be included in the vision mixer. Therefore I would opt for something like a Rendale 8802 or the new RocGen. You won't really gain too much by having a higher quality unit as you will be recording to VHS and, while more expensive units will give better overall quality, I'm afraid to say that much of this will ultimately be lost with VHS. By all means buy the G2 Videocenter if you wish, as it is a good unit, but remember that it is the tape format which finally limits the quality of the picture.

2. I'm not going to stick my neck out and say that absolutely every piece of software will run with every genlock, because Sod's law says that there must be a combination which won't. But all the combinations that I've ever tried have worked fine, so I wouldn't really worry too much about this point.

As an addition to *Deluxe Paint III* I would recommend a video titler such as *Broadcast Titler 2* or possibly the new release of *Scala* (which should have scrolls and crawls and be much smoother). And you will want a few good, clear typefaces in various fairly large point sizes. And of course a digitiser (see point 5) and possibly a HAM paint program such as *Digipaint 3* or *Photon Paint 2*, though you may like to wait for *Deluxe Paint IV*.

3. In general, yes, 2Mb will get you a long way down the road. Most of my work is done on 2Mb of memory, but take care to remember that it's usual that the more colours you use – and the higher the screen resolution – then the more memory will be consumed by your work. Also, animations tend to slow down as

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JARGON BUSTING

Chip RAM – The area of the Amiga's memory directly accessible by the custom graphics and sound chips. Originally a maximum of 512K, the limit on newer machines fitted with the Fatter Agnus graphics chip is now 1Mb, allowing smoother animations and more screens to be displayed at once.

Fast RAM – Any extra memory which is not Chip RAM. The custom chips cannot access it, and because such accesses to Chip RAM can block out the central processor, Fast RAM is faster in use.

ICONX – A handy little program which will enable a Shell script (that is, a collection of Shell commands held in a file) to be executed by clicking on an icon via the Workbench.

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they get larger – so always try to keep the number of colours you use to the minimum necessary and work with the screen resolution best suited to the work you're doing. There are times when all the memory you have won't be enough. It happens to us all. Then you just have to adapt. Or buy more memory.

4. Now, this one's tricky, because I'm confused as to what you mean. If you really require a tape editor then you're looking for something to control your video decks in order to automate the process of cutting the pictures together. And as I assume that you will be using your Amstrad as source machines, I hate to be a spoilsport and tell you that I think you will have very little hope of ever being able to accurately control this particular machine.

However, if what you really mean is a vision mixer, rather than an editor, the situation is a lot more hopeful. There are loads of VMs out there, and quite a few in your price range. For instance, Edit Junior (£180), VEC2050 (£299), Panasonic WJMX10 (can be found for less than £800 if you shop around), Panasonic WJ-AVE5 (£600), JVC JX-SV77 (£600). Now, all these items come with different features and, obviously, different prices. Much as I would like to recommend one to you I think it would be unwise for me to do so as you should try to judge which one will best suit yourself. As always, a good place to look for more information about such items is in a magazine such as *What Video*. Then ask for brochures from the manufacturers, and try to get a demo or two at local dealers.

And when you've finally got a mixer, put the genlock 'downstream' of it (that is, between the mixer output and the recorder) so that you will be able to put graphics over mixes and wipes, which can really help to make everything appear much more polished.

5. Since you have a solid pause then either Digiview or the Rombo Complete Colour Solution will do the job for you. Each has its own good and bad points – Rombo lets you do lots of things like grab live video images, where Digiview won't, but I think that the Digiview quality is superior to CCS. Perhaps you could buy both, with the money you might save on your genlock! Then you could use the Rombo colour splitter with Digiview as well. ***GW***

PASCAL COMPILER

Please can you tell me if there is a program out there that will allow me to program in Pascal on my Amiga 500. Also, I am thinking of upgrading my system to the A3000 league. Do you recommend building up my existing system bit by bit or going out and buying an A3000 straight off?

M Wong
Chislehurst
Kent

At the moment, there is only one Pascal package and that is *PCQ* in the public domain, on Fish Disk 339. It works, but can be a little difficult to set up for anyone unfamiliar with the Amiga Shell.

HiSoft is currently developing a commercial version of Pascal. As with all of HiSoft's packages, it will come with a comprehensive screen editor and a decent manual. It is scheduled for release in the autumn. You can contact HiSoft on ☎ 0525 718181.

As for upgrading to an A3000, it all depends on what you need that sort of power for. If there are certain things you require, such as a faster processor or hard disk, then you are probably better off expanding your present system. But before you could expand your A500 into something equivalent to an A3000, you would have to get some means of increasing the number of expansion slots, such as the Bodega Bay expansion unit. This is before you even buy any of the extras themselves. Also, Workbench 2 is currently unavailable for anything but the A3000, as are some of the new custom chips used in it.

In short, if you want a full A3000, you're probably better off buying one. If you want your Amiga to do some of the things that an A3000 can do, then it would be cheaper and more sensible to expand it. ***CR***

AUTOBOOTING DISKS

I was particularly interested in the letter 'Auto-booting disks' from Keith Pattenden in issue three, but was disappointed with your answer to his question "which directories and files do I need to make my compiled disk run?" I felt that the c/devs/libs/l response was pretty feeble and that we were fobbed off somewhat. How about a more explicit answer that takes us a little beyond startup?

As I write, my Amiga displays the day and date as being Monday 10 June 91. Why won't it respond to my attempts to correct that, ie 1.SYS: HH:MM:SS DD-MMM-YY?

Malcolm Brown
Winchester
Hampshire

I'm sorry, but the answer was the best that we could give under the circumstances. The Amiga has a complex operating system in which lots of programs and files have interdependencies on others. Which of these programs and files need to be present on a boot disk depends entirely on the nature of the user programs to be included on the boot disk. There are so many possibilities that it really is difficult to make generalisations other than to point out, as Mark did, the uses of each of the system directories. The only real answer is to gain a knowledge of AmigaDOS, won by a slow process of trial and error.

The time and date is set from the Shell by means of the DATE command. For example:

```
DATE 12:50:00 25-Jul-91
```

Either of the two parts may be omitted. This date will be forgotten when the machine is switched off. If you have a battery backed-up clock, you can prevent this by using the SETCLOCK command to save the date and time. The line to type is:

```
SETCLOCK SAVE
```

CR

JARGON BUSTING

Intuition – Intuition is the part of the Amiga's operating system concerned with handling windows, menus and so forth. It interprets users' input from the mouse and sends information to the relevant windows via the Intuition direct communication message ports.

INTUITION STRUCTURES

I am currently having a fairly enjoyable time using the Abacus book *C for Advanced Programmers*, to explore the ins and outs of windows and screens under the Intuition library routines.

Obviously this involves using a lot of structures defined by Intuition and, of course, when I refer to these structures I have to use the pre-defined names for them. However, when I want to stick pointers to the structures I've been able to call the pointers by any name I like. For example, NewWindow has to be referenced by exactly that name, but the pointer I put onto it can be:

```
struct NewWindow *NWPtr;
```
or
```
struct NewWindow                    ↵
*MyNewWindowPointer;
```

or any other name that I choose.

So far so good. This worked well in every case except one. Trouble came when I wanted to open the Intuition library itself, and had to put a pointer to the IntuitionBase structure. I found that the program Gurued unless I did the following:

```
struct IntuitionBase                ↵
*IntuitionBase;
```

That line works fine. Any other name for the pointer, such as

```
struct IntuitionBase                ↵
*IBase_pointer;
```

crashed and I can't see why. The pointers are all variables in my program. Why can't I set up a pointer to IntuitionBase and call it what I want to? It was a pig of a bug to find, and I'd like to know if any other sensitivities to pointer names exist.

I am using Lattice C (version 3). Is it the compiler playing up, is it me, or is it the Amiga libraries?

Alun Evans
Ynysforgan
Swansea

This library pointer problem has nothing to do with your compiler – it stems from the things that go on beneath the surface of your C library calls. By convention the 68000's register A6 *must* contain the library base pointer when a library routine is called. Once in place, the library calls are made using an indirect subroutine call which uses the library base address together with a library offset vector (LVO) value used to identify the particular library routine being called.

The reason that the above details never concern the C programmer is because amiga.lib, which you'll be linking with, contains the stub code that carries out all the hard work. In general this interface code will pull any required parameters off the stack, place them into the right registers, and then make the appropriate indirect subroutine call. You'll notice that you do not have to explicitly pass the library base address as a function parameter when making a library call, and this is because the stub routines look for, and expect to find, external references to the base pointers. These are resolved at link time and this means, of course, that the C programmer must have declared a suitably named set of global, ie externally visible, library pointer names. It is for this reason that the specific library base names mentioned in the Amiga technical reference books *must* be used by the

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C programmer. This 'sensitivity' therefore applies to all library base pointers. You can get full details from either your compiler documentation or the *ROM Kernel Manuals* but here are brief details of a few of the run-time libraries together with their standard pointer names:

Library	Pointer name
diskfont.library	DiskfontBase
dos.library	DOSBase
exec.library	SysBase
graphics.library	GfxBase
icon.library	IconBase
intuition.library	IntuitionBase

PAO

FIXING THE FLICKER



There is a Flicker Fixer for the A500 produced by ICD and sold by Power Computing. Do you know, or can you find out, if this Flicker Fixer is compatible with the ECS Denise and its associated screen modes, as I am considering buying the Flicker Fixer but don't want my £250 to be wiped out when I buy the ECS Denise chip. Incidentally, I do have a multi-sync monitor.

Dean Aston
Scarborough
North Yorkshire

I haven't seen the ICD Flicker Fixer but I contacted Power Computing and this is what I was told: it will work with the new Denise and with the new screen modes, provided you have a suitable amount of Chip RAM. Power Computing are a helpful bunch and it wouldn't hurt to give the technical department a ring (☎ 0234 843388) because they'll be able to give you the ins and outs of exactly what has to be done when you upgrade to the new chip.

In general I personally tend to be very pessimistic about all such hardware compatibility issues. If I was in your position I'd also write to the company's technical department stating my concern about possible incompatibility problems. Once I'd got a suitable written reply, and had decided to order the unit, I would specify that the unit was being ordered on the strict understanding that it was, as indicated by the reply, suitably compatible. ***PAO***

PRINTER DRIVER FOR SEIKOSHA



I have recently bought a Seikosha SP-200 printer for my Amiga. I am using the Epson X Old printer driver which seems to work fine for text but not graphics. I have also tried the CBM-MPS_1250 driver but with the same result – great text, just rubbish with graphics. Am I using the wrong drivers, or is it something else?

Also, if (and when) I get Workbench 2, will I be able to use the new 2Mb Agnus chip in my A500? What exactly is the ECS? Is it just a replacement for Agnus or is there more to it than that?

G Sidaway
Oxshott
Surrey

As far as the printer goes, just about any driver will work with text – graphics, on the other hand, are a different can of worms altogether. You could try using the CBM_MPS1000 driver, since this will drive IBM-compatible printers. If that doesn't work, check the printer's configuration. The manual will show you how, but it will probably be a set of dip switches. If you have a choice, make sure you set an Epson X emulation and use the CBM_MPS-1250 driver.

ECS stands for Enhanced Chip Set and comprises the Kickstart 2 ROMs, Fatter (1Mb) Agnus and Fat Denise. Paula, the other main custom chip has not changed and Ramsey is only fitted to the A3000. Officially the A500, A1500 and A2000 machines are only fitted with 512K of Chip RAM; 1Mb Chip is fitted to a few of the latest A2000s and A1500s; 2Mb of Chip (and a Super Fat Agnus) is only available with the A3000 machine.

According to Commodore, it is not feasible to fit a Super Fat Agnus to the A500 because it's technically almost impossible. Without going into the pros and cons of the upgrade, it would involve constructing a piggy-back module to fit in the existing socket which carries the extra 1Mb of RAM. At least one hardware developer in the US is believed to be working on such a system, but whether it is of any use remains to be seen. As for the rest of the ECS, unless you have Workbench 2 the extra chips are, quite frankly, a waste of money. ***MS***

PARTITIONING DRIVES

A **I have a B2000 and a Quantum 100Mb hard drive with a Commodore A2091 controller. According to the A2901 manual, you can have more than one bootable partition, so how do I switch from loading one partition to another during startup? I want Workbench and business packages on one partition and Nico Francois' program selector menu system on another, so that I can use iconless utilities without fiddling around with the CLI.**

Also, how do I get some public domain disks which are not Workbench-compatible on to my hard drive so that I can load and boot them at will? Some PD disks do have disk icons, but no other icons. What is the best way of putting them on my hard drive? Finally, are there any good books on hard drives and the A2091 for beginners?

Robert Hart
Roehampton
London

In practice you cannot have more than one bootable partition active at the same time, because the highest priority partition will always take over the boot sequence. For instance, if you have a boot disk in DF0: and boot the machine, it starts from the floppy not the hard disk. What you need to do is hand control from the boot partition to a second partition during startup, and this is easily achieved with a few lines of AmigaDOS code. Exactly what you put in there depends on how you have set up your machine.

Here is a typical example of a Startup-sequence which hands control over to a second partition on request:

```
Addbuffers df0: 10
SetPatch >NIL:
Sys:System/FastMemFirst
echo "A2091 Boot transfer ↵
disk.*n"
ask "Press Y <Return> to get↵
Workbench or <Return> for ↵
Selector"
if warn
   assign s: DH1:S
   ; Move scripts to DH1
   assign c: DH1:C
   ; move commands to DH1
   assign l: DH1:L
   ; move handlers to DH1
   assign libs: DH1:LIBS
   ; move libraries to DH1
   assign devs: DH1:DEVS
   ; move devices to DH1
   assign fonts: DH1:FONTS
   ; move fonts to DH1
   assign sys: DH1:
   ; move root to DH1
   echo "Booting from DH1:"
   echo >RAM:delme ↵
"Workbench"
   ; set a temporary flag
endif
BindDrivers
Setclock Load
FF >NIL: -0
resident CLI L:Shell-Seg ↵
SYSTEM pure add
resident c:Execute pure
resident c:Resident pure
resident c:CD pure
makedir ram:t
makedir ram:env
makedir ram:clipboards
assign T: ram:t
assign ENV: ram:env
assign CLIPS: ram:clipboards
mount newcon:
mount speak:
mount aux:
mount pipe:
Sys:System/SetMap gb
path ram: c: sys:utilities
sys:system s: sys:prefs add
if exists RAM:delme
   LoadWB delay
   ; If required, start ↵
Workbench
else
   run Selector
   ; Start selector here
endif
endcli >NIL:
```

This approach suffers from a few problems – not the least of which is that you have to decide which partition to boot from every time you start the machine. Less importantly, you have to have a complete copy of Workbench on both partitions and the Preferences can only be set from the Workbench partition. As you can see, the deeper you loo, the more involved it gets. If you wish to try this, the following command line will install Workbench on your hard drive's second partition (assuming it's DH1). Boot your machine, open a Shell window and insert your original Workbench disk in the internal drive. Now type:

```
COPY FROM DF0: TO DH1: ALL
```

Although there are books around on hard drives, they all assume a good working knowledge of the system. You could do worse than read *Mastering AmigaDOS 2* volumes 1 and 2 by Mark Smiddy and Bruce Smith. They cover all major AmigaDOS releases in more depth than ever before – volume 1 has four chapters devoted to scripting and startup-sequences which is precisely the sort of things you need to know. They're available from all good bookshops or mail order from our sister magazine *Amiga Format*. ***MS***

JARGON BUSTING

ECS – This is short for 'extended chip set', and is the name given to the new versions of the Amiga's custom VLSI (very large scale integration) chips which control the computer's graphics and sound output.

Beginners start here

On the next three pages, technical editor Cliff Ramshaw answers a number of question frequently asked by those new to the Amiga

Having taken your brand new Amiga out of its box and plugged it in, you may well be more than a little bewildered at what confronts you. Although the machine is on the whole easy to use, there are a host of concepts to learn before you can make full use of it. Here we aim to outline some of these fundamentals to save you time and effort in coming to grips with your new machine; but always remember that the best way to learn about the Amiga is to experiment.

WHAT IS A COMPUTER?

A computer is a machine which will follow a set of instructions. It cannot think, but merely does what it is told. The instructions which it follows can come from a number of sources: instructions held internally, from the makers of the computer; instructions from a third-party program which is loaded in from a floppy disk; instructions from you, the user, typed in at the keyboard. The results, known collectively as 'output', are sent either to the screen, to the printer (if you have one) or to the disk in the floppy disk drive.

HOW DOES IT WORK?

Well, without getting carried away... at the heart of the machine is something called the Central Processing Unit (CPU). This is the bit which interprets the instructions sent to it (in a very simple language called 'machine code') and does what they tell it to. The instructions are held in the computer's memory.

MEMORY

The classic analogy is that of comparing memory to matchboxes. Imagine an incredibly long row of matchboxes, each numbered and each with something inside it. The contents of a memory location can be found or changed by referring to the number of the relevant matchbox, opening it and taking a look (or putting something else in). In practice, all that these matchboxes contain is numbers, but these numbers can be understood by the computer as words, pictures or sound (or indeed they can be kept as numbers). There are two main types of memory: RAM and ROM. RAM (standing for Random Access Memory) can be altered at any time by the computer. Once the power is switched off, the contents of RAM are 'forgotten'. ROM (Read Only Memory), on the other hand, is never changed, even when the power is switched off. It contains the basics of the operating system – the set of instructions which determine the overall behaviour of the machine at all times.

Memory is measured in units known as bytes. In every byte a number between 0 and 255 can be held. To hold bigger numbers, or more complex items of information, bytes are joined together into larger units. More conveniently, memory is spoken of in terms of kilobytes (K) or Megabytes (Mb). A kilobyte is 1,024 bytes; a megabyte is 1,024 kilobytes or 1,048,576 bytes. The reason that they are not nice round 1,000s and 1,000,000 lies in the organisation of bytes according to the rules of binary arithmetic, but that's not important right now...

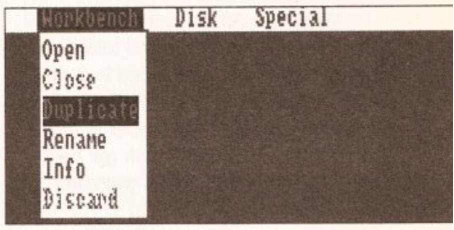
FAT AGNUS

Possibly the most common question we get asked here at *Amiga Shopper* is about the Fat Agnus chip. Agnus is one of several custom chips inside the Amiga dedicated to producing graphics and sound. Whereas the Amiga's central processor can access all of the memory in the machine, the Agnus chip is limited to a much smaller portion, known as Chip RAM (since it can be accessed by the custom chips).

It is here that graphics information must be stored. Anything you see on the screen has an equivalent form inside the Amiga's memory, in Chip RAM, and it is Agnus (amongst others) that does the job of converting this information into the form of a picture.

The rest of the Amiga's RAM (as opposed to ROM) is termed Fast RAM. Whenever Agnus accesses the Chip RAM, it prevents the Amiga's central processor from doing so at the same time. Because much of what a processor does involves accessing memory, this has a tendency to slow the processor down. Memory which is not Chip RAM, on the other hand, can be accessed by the processor whenever it likes, without a speed penalty. And that's why it's called Fast RAM.

Now, the more Chip RAM, the better, since it means that more complex graphics can be on screen at once, bigger and smoother animations can be performed and more impressive sound samples used. The early Agnus chips could access 512K of Chip RAM, or half of a megabyte (the amount of memory that comes with an Amiga 500). This chip is numbered 8361, and was present on A1000s and early A2000 machines.



The Workbench menu; and someone's about to try duplicating a disk.

After that came the Fat Agnus, with a shape more like that of a square and a couple of extra features. This is the one in the majority of Amigas. Its part number is 8371 (or 8370 for the American version). Like its predecessor, it can access 0.5Mb of Chip RAM.

In the last year or so, Amigas have been released with an even newer Agnus chip. This is known as the Fatter Agnus, and it can recognise 1Mb of Chip RAM. It has part number 8372a. An even newer version exists, accessing 2Mb of Chip RAM, but this is only available for the new Amiga 3000.

Hope that's cleared things up.

WHAT ABOUT DISKS?

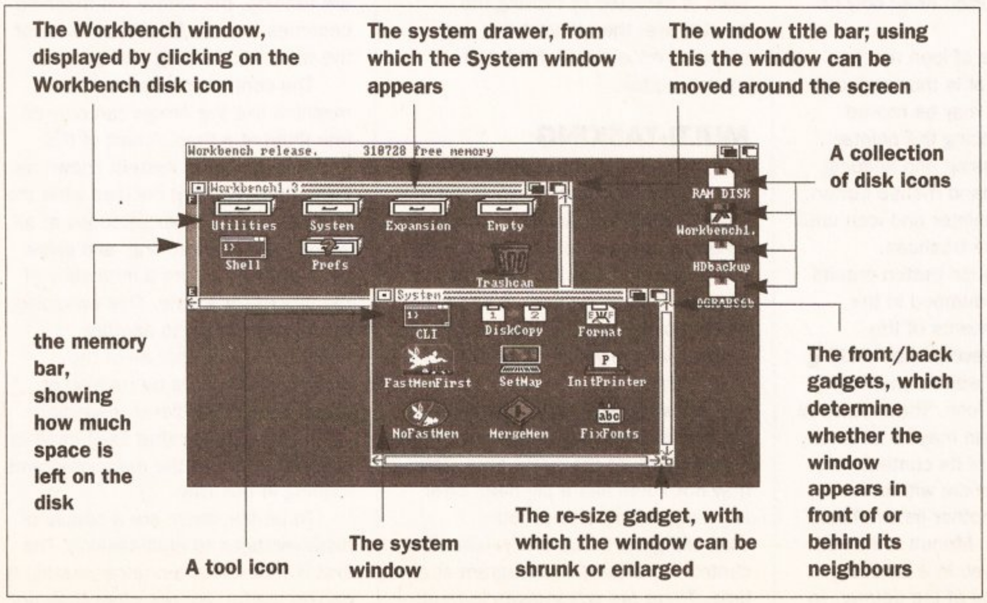
Disks can be thought of as removable memory. The difference is that the processor cannot directly access anything held on a disk. Before it can get its hands on it, the contents of the disk must be 'loaded' into the computer's RAM.

Information is stored on a disk in the form of files. A file is simply a grouping of related infomation with a name. The information is referenced by using the file name.

AND RAM DISKS?

This is a special kind of 'imaginary' disk drive. You may have noticed that floppy disk drives can be rather slow; the RAM disk is one way around this problem. It works like this: an area of the Amiga's memory is set apart from the rest, and this area is treated just as if it were a disk drive. Information can be stored and retrieved in just the same way as a floppy disk. When a file is loaded

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This illustration shows the basic components of the Amiga screen.

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from the RAM disk, the information is copied from that part of RAM into the Amiga's normal memory where it can be used as normal.

When the Amiga is switched on, the RAM disk is empty and takes no space. As things are placed in it, its size increases as needed. The important thing to remember is that **everything** in the RAM disk will be lost when the machine is switched off or reset.

INFORMATION

Two types of information may be held in memory and on disks. The first type is the information which makes up a program. A program is a collection of instructions for the computer to follow. As well as the operating system, which is nearly always present, the Amiga may have several programs 'running' inside its memory at any one time. These can instruct it do such things as draw pictures or operate a spreadsheet.

The second type of information is known as 'data'. This is also held in RAM, but instead of providing instructions for the CPU, it provides information on which the programs may operate. For instance, a program which adds two numbers together needs some data before it can be of any use. These two numbers are the program's input data. The result of the addition is the output data. Another example is given by the *Deluxe Paint* package. This is a program. Any key presses or mouse movements you make are input data for the program; the picture that is gradually drawn is the output data. Of course, this picture may be saved on to a disk at any time, and loaded back at a future date. In such a case, the picture has now become input data for the program. As you can see, the distinction between input and output data can become somewhat blurred.

WIMP

In days of yore, people used to control computers exclusively by keyboards. Because of the relatively new WIMP (windows, icons, menus, pointer) system, many tasks can be greatly speeded up and performed in a more intuitive manner (hence the name of the part of the Amiga's operating system that deals with this: Intuition).

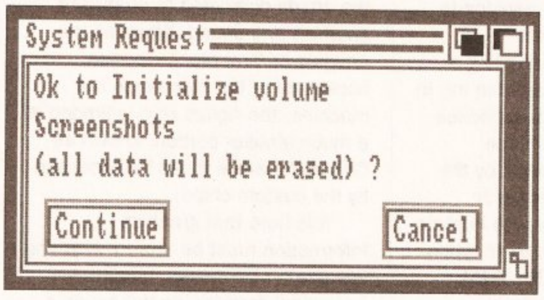
All disks, programs and related collections of data are displayed on the screen as small pictures, known as icons. To prevent things getting too cluttered, the screen is divided into small sections called windows, in which the icons relevant to that window are displayed. Each window may be open or closed (in which case it reverts to either a disk or a drawer icon), moved around relative to the screen, moved in front of or behind other windows on the screen, and resized to display more or less information. All of this may be done by means of gadgets – small graphical symbols around each window's borders that represent these functions. Windows may be nested hierarchically inside each other by means of drawer icons. Whenever a drawer icon is opened, a new window is drawn with its own icons within it.

Icons are accessed with the screen pointer, which is moved across the screen by moving the mouse across the desk. Once the pointer is above an icon, that icon can be accessed by pressing the left mouse button twice in quick succession (a process termed 'double-clicking'). The effects of this will vary depending on the icon in question: in the case of a disk or drawer icon, a window will be opened; in the case of a program (or 'tool'), the program will be loaded from disk into RAM and run (in other words, the Amiga will start to follow the instructions contained in the program); clicking on a data icon (or 'project') will result in the data's corresponding program or tool being loaded from disk along with the data on which it will begin to operate. The pointer is also used to control a window's gadgets, but in this case the left mouse button need only be pressed once.

A special type of icon that you should be aware of is the 'trashcan' icon. Other icons may be moved inside here by placing the pointer above them, pressing and keeping pressed the left-hand mouse button, and moving the pointer and icon until they are above the trashcan. Releasing the mouse button results in the icon being dumped in the trashcan. The contents of the trashcan can be revealed by clicking on it in the same way as you would click on a drawer icon. The difference is that the trashcan may be emptied, in which case all of its contents are gone for good. Handle with care.

Menus are another innovation of the WIMP system. Menus are a list of options displayed in a text box, selected by means of the pointer. In this way, more complex operations can be performed with the mouse and without recourse to the keyboard. When first switched on and with Workbench loaded in RAM (Workbench is the part of the Amiga's operating system which is not held permanently in ROM), a basic set of menus are available which enable you to do such useful things as copy disks and so forth. Most programs have their own custom set of menus, relating to the particular things that the program is used for.

Menus are displayed at the top of the screen. Pressing the right-hand mouse button (and keeping it pressed) reveals the title of each available menu in the white bar at the top. Moving the pointer up to one of these titles (with the mouse button still pressed) will cause the Amiga to display the list of options in a box beneath the title. As the pointer is moved down this box, each of the options will be highlighted in turn. Releasing the right-hand mouse button with one of the options highlighted will result in that option being executed.



A system requester, giving a chance to reconsider.

Although not mentioned in the WIMP acronym, another aspect of the system is the 'requester'. A requester is a box that appears on the screen during an operation – usually a dangerous one such as erasing a disk – displaying a small amount of text and asking the user for what is normally a yes or no reply. In the case of erasing a disk, the text will say 'Ok to initialise volume [name of disk] (all data will be erased)?'. Two gadgets are displayed, one with 'Continue' written in it, the other displaying 'Cancel'. The option you want is selected by moving the pointer over the relevant box and pressing once on the left-hand mouse button.

MULTI-TASKING

One of the Amiga's special features that you've no doubt heard about is multi-tasking. The Amiga is unique amongst home computers in having this feature; in fact it's not until you begin to look at computers very much more expensive than the Amiga that you will normally find such a thing.

But what is it? Basically, multi-tasking is the ability to run more than one program at the same time. This may not seem like a big deal: after all, there is only one of you controlling the thing, and you can't control more than one program at a time. There are advantages to multi-tasking, though.

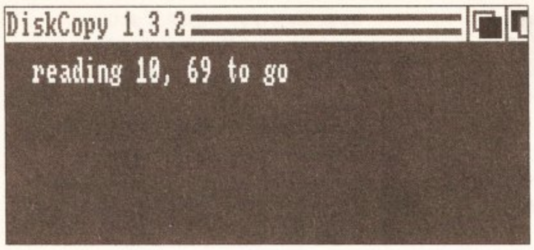
At its simplest, multi-tasking allows several programs to be running in memory, waiting for you, the user, to use them. You can be working on one of these programs, a word processor for instance, and suddenly realise that you need to do some mathematics so that you can put the answers to some calculations in your document. Ordinarily, you would have to quit out of the word processor, load up the calculator program (OK, I'm assuming you don't have a pocket calculator, but you get the idea), do your sums and write down the answers, then quit out of the calculator and load your word processor again, load in your document, find where you were in it and type in the answers from your piece of paper. Quite a hassle. With the Amiga, the calculator could have been waiting in the background all along, eager to help you out. A couple of mouse clicks brings it into action, and you can get your results there and then. Again, a couple of mouse clicks brings back the word processor, exactly where you left it. With more sophisticated software, you will often find that the data can be directly transferred from one program to another, saving you even more work.

Another advantage of multi-tasking is in running programs which require little or no user input. For instance, you could set a Mandelbrot generator (see the supplement which was free with this month's issue if you don't know what one of these is) going, and meanwhile get on with adding up your family accounts or whatever.

Theoretically, there is no limit to the number of programs you can have running at once. In practice, the number is limited by your available memory: each program requires its share. Also, the more programs that are running, the slower the machine becomes overall. This is because of the way multi-tasking works.

The central processor of a machine like the Amiga can only do one thing at a time. A part of the Amiga's operating system known as Exec (for Executive) decides what the processor will do next. It looks at all of the programs running, and gives each of them in turn a little slice of the processor's time. This swapping from one program to another happens so fast that all of the programs seems to be running at once. It's all very clever, especially when you consider that Exec itself is just one amongst the many programs running in this way.

To be fair, there are a couple of disadvantages to multi-tasking. The first is that it is often unnecessary. It *can* be useful, but ore often than not you will want to use your computer



The display you can expect when copying (duplicating) a disk. A disk is divided up into 80 cylinders, most of which have yet to be copied.

for one job at a time. But because multi-tasking is such a complex business, it means that the Amiga's operating system is much bigger and complex than it might otherwise be. And this means that it is more likely to fall over occasionally, which leads us on to the second disadvantage: crashing. On mini and mainframe computers, which as well as being multi-tasking also support several users, each program is well protected from all of the others running at the same time. That way, if one program crashes, the rest can go on unharmed. With the Amiga, though, this is not the case. It is possible for a rogue program to effect any others that may be present. In general, if one program crashes on the Amiga, they all crash and the machine has to be re-booted. If you've been entering your accounts for the last hour and a half when your Mandelbrot program decides to crash, all of your typing will be lost. This is one good argument for saving your work to disk at regular intervals.

COPYING DISKS

One of the first things you should do after unpacking your Amiga is make copies of your Workbench and Extras disks. This also applies to any other disks that you get, although most games and some serious software won't allow you to do this in the interests of preventing piracy.

Copying disks is a good idea because disks have a tendency to get corrupted and lose whatever is stored on them from time to time. Always use the backup copies that you have made, and store the originals in a safe place against the eventuality that your backups fail.

Copying disks on the Amiga is easy, although if you only have one disk drive it can take a little bit of time. In the following description, I'll assume that you only have one floppy disk drive.

First, boot the machine up as normal (this simply means 'switch it on and put in the Workbench disk when you are told to do so'). Then insert the disk that you want to copy. Move the pointer over the disk's icon, and click on it once with the left-hand mouse button. The icon should change colour. Now, using the right-hand mouse button, go to the Workbench menu at the top of the screen and select the Duplicate option. A requester will appear asking you to replace the Workbench disk. Do this. There is no need to click on the 'Retry' box: the Amiga will realise when you have inserted the correct disk.

You will then be asked to insert the disk that you want to copy. Having done this, you will be asked to insert the 'SOURCE' disk. Actually, this is exactly the same as the disk that you want to copy. If you are sure you have inserted the right one, click on the Continue gadget in the requester with the left-hand mouse button. The Amiga will start reading the information from the disk, keeping you informed as to how much of the reading it has done and how far it still has to go.

After a time, you will be asked to insert the 'TO' disk. Insert a spare disk, but be sure that there is nothing on it which you want to keep, since all of its original contents will be lost. Once this disk is inserted, click on the Continue gadget. The Amiga will start writing the new information to the disk.

Once this is done, you will be asked to insert the SOURCE disk again. This process of swapping disks will continue until the whole of the original disk has been read and susbequently written to the new disk. After this, the new disk will be named as 'copy of [name of original]'.

It is usually a good idea to rename the disk as something more sensible. To do this, select the disk by clicking once on its icon with the left-hand mouse button, then go to the Workbench menu and select the Rename option. Delete the text of the old name in the box provided, and then type in the name by which you want to refer to the disk. When you are done, press the [Rreturn] key and the whole process is finished.

THE SHELL

Although most things that would ordinarily require a keyboard can be done on the Amiga using the mouse and WIMP system, there are nevertheless hidden depths which can only be accessed by means of good old typing. These functions are performed by using the Shell, which has an icon that looks like a miniature window.

Older versions of Workbench (version 1.2 and below) don't have a Shell. Instead, they have a CLI (standing for Command Line Interface), which works in pretty much the same way but lacks some of the Shell's more advanced features and is therefore a bit more awkward to use. The CLI's icon looks just like that of the Shell, and may be found in the System drawer of the Workbench disk. If it is not visible, the Preferences icon must be clicked on (inside the Preferences drawer). Once loaded, Preferences will display a screen-full of options, one of which will refer to the CLI. Click on this, and next time you look in the System drawer the CLI will be there, ready to go.

Clicking twice on the Shell or CLI icon will open a text window on the screen. It is generally a good idea to enlarge this window so that it takes up all of the screen, since a lot of text can be generated when you are working here.

A full description of what can be done in the Shell is really beyond the scope of this section, but we'll give you a quick taster. One of the most used commands is the 'directory' command, which gives a list of files (programs and collections of data) on a disk. When the Shell opens, you are presented with a 'prompt' inside the window. This prompt consists of the number of the Shell (more than one can be open at once) and the name of the current disk. In the case of the Workbench disk, this name will be 'SYS:', one of its many names (just to keep life simple). In the Shell, the names of all disks are followed by a colon (':'). At this prompt, type the word 'dir' and press the [Return] key.

The disk will whirr, and you will be given a list of all of the files on the disk. You may be surprised to find that there are a lot more files than there are icons when viewed from an ordinary window. For a file to be shown as an icon, it must have a corresponding file with the same name but followed by the characters '.info'. This second file contains information about the icon, such as what it looks like, what kind of file it represents, and where on the screen it should be displayed.

Some filenames have the characters '(dir)' after them. This is not part of the name, but an explanation that the file in question is not a file at all but a directory. A directory is exactly the same as a Workbench drawer. Things are held within it. For example, on the Workbench disk there is a directory called 'c' (standing for 'commands'). This is not visible except from the Shell, because there is no corresponding 'c.info' file and therefore no icon. To find out what is in this directory, type 'dir c' and press [Return]. What is displayed is a list of files. In this case, each of them is a program which you can run by typing its name in at the Shell prompt. If you look closely, you will find a command called 'dir', which is the one you have been using to look at the Workbench disk's contents. For more information about the Shell, check out Mark Smiddy's monthly AmigaDOS column. AS

IN NEXT MONTH'S ISSUE...

Every month in *Amiga Shopper* we print 16 pages of Amiga Answers – answers for everyone from beginners to experts. If you have a question, fill in the form on page 50 and pop it in the post to us.

Amongst the questions we intend to answer in next month's issue are the following:

- **"How can I use a Sony 3.5-inch disk drive with my Amiga 500?"**
- **"Can you tell me how well the public domain Commodore 64 emulator works – how compatible is it likely to be with my software?"**
- **"Can I adapt a colour Olivetti monitor to work with my Amiga?"**
- **"I would like to superimpose Amiga graphics over video footage of the Empire State Building. How can I do this?"**
- **"I'm having trouble printing out listings from the Amos Basic interpreter. Can you shed some light on this for me please?"**
- **"I would like to keep records of my family tree, and I want to use Superbase Personal to do it. Any tips which you could give me would be greatly appreciated."**
- **"I'm puzzled. What exactly is AMOS, and what can I do with it?"**
- **"Can you tell me, please, what the Gary chip is and what it does? Why do I have to connect my Megaboard to it?"**
- **"I want to use my Amiga for business accounting. Can you give me any suggestions of the type of programs I should be considering?"**
- **"I want to write an AMOS program to create crossword puzzles but I don't know how to go about it. Can you help?"**
- **...and much, much more!**

User groups list

If your group isn't mentioned, fill in the form at the bottom of the page to let us know about you

1520 Plotter Group (ICPUG) Contact John Bentley ☎ 06286 65932.

Amigaholics Club For beginners and some experts. Free membership. Own disk magazine. Contact Kevion Bryan ☎ 071-580 2000 Ext 240 or write to 29 Wolfe Crecent, Charlton, London SE7 8TS.

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. A club for Amiga artists, musicians and coders for mutual assistance and programming demos. No pirates, genuine Amiga artists only. Membership is free, contact KAM on ☎ 0532 493942, 5pm-8pm.

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry, BT49 0QG. A club to help newcomers to the Amiga. There is a bi-monthly club disk, and a small PD library. Membership costs £2 for a single disk, or £20 for every issue.

Amiga Users Klub, Windsor House, 19 Castle Street, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga computing and to help solve people's problems. Contact Jack Talling.

Amiga Witham Users Group 85 Highfields Rd, Witham, Essex CM8 1LW. Distributes tips and Basic programs. Keith Anderson ☎ 0376 518271.

Anglesey ICPUG Meets every Monday 6pm-9pm at Holyhead Unemployed Workers Club. All machines from C64 to Amiga. Contact Nick Massey ☎ 0407 765221.

Ayr ICPUG Meets at Radix Training Centre, West Sanquhar Road, Ayr. Contact John Smith ☎ 0292 261408 Ext 202.

Basic Programmers Group 68 Queen Elizabeth Drive, Normanton, West Yorkshire WF6 1JF. Set up to encourage the use of Basic, exchange ideas and assist beginners to the language. Free newsletter from Mark Blackall ☎ 0924 892106.

GET YOURSELF LISTED

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

Group name ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Place of meetings ....

....

Time of meetings ....

Type of activities ....

....

....

Membership fee **AS6**

Bury St. Edmunds ICPUG Contact Alan Morris ☎ 0359 51446.

Buxton ICPUG Contact Peter Richardson ☎ 0298 23644.

Chester-le-Street 16 Bit Computer Club Conference Room 2, The Civic Centre, Newcastle Road, Chester-le-Street. The club meets every Monday from 7.30-9.30pm to see each others' software collections, exchange advice and tips. Contact Peter Mears ☎ 091-365 2939.

Club Amiga 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear DH4 4PP. Membership costs £15 a year for a disk magazine, PD software and a 24-hour telephone helpline service (091-385 2627). For more information send an SAE to Chris Longley.

Computer Club 16 Laton Road, Hastings, East Sussex ☎ 0424 421480. This is a 16-bit club dedicated to being computer enthusiasts without being pirates. Membership costs £15 per year, and the club has arranged discounts with several local firms.

Coventry ICPUG Meets on the first Wednesday of the month. Bring your computers. Contact John Orange ☎ 0203 689635.

Disabled Group (ICPUG) Contact David Bate, 71 Bedford Road, Bootle, Merseyside L20 7DN.

Dublin ICPUG Meets fortnightly on Fridays (except August) at St. Andrews College. Covers all Eire, 36 page newsletter. Discounts arranged. Contact Geoffrey Reeves ☎ 010 353 12 883863.

Dundee ICPUG A new group which hopes to meet at Bits and Bytes, 21b Commercial Street, Dundee. Contact Dave Thonton ☎ 0382 505427.

Edinburgh ICPUG Contact Martin Lowe, Amiga Centre Scotland ☎ 031-557 4242.

Genealogy Group (ICPUG) Contact Steve Turner, 27 Burley Close, London SW16 4QQ.

Independent Commodore Products Users Group Biggin Hill Library, Church Road, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. There are lecture nights and open nights where members can get help. See also regional entries. Contact John Bickerstaff after 8.30pm ☎ 081-651 5436.

Macclesfield ICPUG Meets at The Harlequin Club, Chestergate, Macclesfield, every Tuesday from 8-11pm. Contact Peter Richardson ☎ 0298 23644.

Mid-Thames ICPUG Meets at Cox Green Community Centre, SW of Maidenhead, on the second Thursday of the month at 7.30. Open nights and some talks. Newsletter. Contact Mike Hatt ☎ 0753 645728.

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Meets on the last Thursday of the month. PD library, bulletin board, advice from Amiga experts. Contact Philip Worrel.

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. Offers a forum for exchanging old, unwanted games for a small price. Contact Michael Pun on ☎ 021-459 7576.

Solent ICPUG Meets at GEC Aerospace Sports and Social Club, Titchfield, Hants, first Tuesday of the month at 7.30. Open nights and some talks. Contact Anthony Dimmer ☎ 0705 254969.

South West ICPUG Meets second Sunday of the month at Queens Arms Hotel, Charmouth, Dorset, at 10am. Bring your computers. Some talks. Contact Peter Miles ☎ 0297 60339.

Stevenage ICPUG Meets at Hertford Road Community Centre, Stevenage, last Friday of the month at 7.30pm. Contact Bob Grainger ☎ 0438 727925.

The Pennine Amiga Club 193B Oakworth Road, Keighley, West Yorkshire BD21 1RE. Offers free membership, free advice, and circulates a newsletter. Contact Simon Booth ☎ 0535 600437.

Watford ICPUG Long standing club with friendly atmosphere. Meets third Wednesday of the month, 7.30pm St Thomas Church Hall, Watford. Membership £12. Contact Rod Eva/Mark Pryor ☎ 0923 50161.

West Riding ICPUG Meets at the White Horse Inn, Fall Lane, East Ardsley, Wakefield, first and third Tuesdays at 7pm. Open nights. Minibus to London shows. Contact Kevin Morton ☎ 0532 537318.

Wigan ICPUG Contact Brian Caswell ☎ 0942 213402.

Cracking the

With metaphorical screwdriver in hand, Mark Smiddy shows you how to tune your Amiga's startup-sequence for the best possible performance



"Commodore's supplied startup-sequence is generalised for all machines, but it can be improved – here's how..."
Mark Smiddy

In last month's AmigaDOS pages I introduced and dissected the Workbench 1.3 startup-sequence script. Just to shake out the cobwebs, the startup-sequence is a script used to configure the machine every time it boots itself up. The startup-sequence does just about everything from speeding up the text display to improving disk access, before finally activating the Workbench itself.

An important concept to grasp here is that Workbench is shared between the ROM (Kickstart) and the command line interface, or CLI (AmigaDOS) and can be activated very quickly if necessary. When the machine 'boots', several things happen automatically without you even being aware of them. In simplified terms, the sequence of events occurs roughly like this:

● Kickstart puts the machine through a self-test to ensure that everything seems OK. This happens as the machine cycles through the shades of grey and the 'Caps Lock' light on the keyboard flashes.

● If all goes according to plan, the ROMs then start searching for a bootable device in the following order of priority: df0: (the internal disk drive) is checked first, then in Kickstart 1.3 only, the rad: disk is next, and then finally the hard disk is checked. (Presumably the CD drive will have the same priority as a hard disk – we'll just have to wait and see.) Kickstart 2 owners may notice that the machine also searches other floppy drives and tries to boot from those too. In this case, a bootable device means a disk drive with a disk inserted.

● If a boot disk is found, Kickstart loads and executes the bootblock [illegible]m track zero. This, incidentally, is how [illegible]any viruses get into the machin[illegible] A normal boot code then activates a[illegible] hands control back to the ROM-based [illegible]igaDOS code. AmigaDOS lives partly in ROM and partly on disk. The commands you execute come from disk, but the basic (CLI) interpreter and disk handling is all ROM-based.

● At this stage AmigaDOS automatically makes a number of directory (logical device) assignments (see the table below).

When this has been done, Intuition asks AmigaDOS to look for a file in DEVS: called 'System-configuration'. If found, the file is loaded and passed to Intuition where it is used to set the preferences: screen colours, pointer style, default printer and its setup and so on. If the system-configuration is missing, Intuition sets the default preferences. This is most noticeable if you normally work with different colours or an 80 column screen – since the default is a blue screen with 60 columns.

● And now... the Workbench screen and default CLI windows open and the CLI announces itself: AmigaDOS ©1987 Commodore-Amiga Inc. etc. Even though a lot has happened behind the scenes, this only takes a couple of seconds. The laborious part comes next as AmigaDOS searches the S: assignment for the startup-sequence file – the subject of this discussion. The startup-sequence is loaded from disk and executed like any other AmigaDOS script – but it takes a long time because of all the disk accessing involved as command after transient command is loaded and executed.

REDUNDANT STARTUPS

A lot of the 1.3 startup-sequence is redundant. This may seem odd, but you have to remember that it has to cope with dozens of different possible configurations. Individual machine configurations tend to remain static once you have passed the initial "What can I buy next?"

An improved 1.3 startup-sequence

```
Addbuffers df0: 10
SetPatch >NIL:
echo "A500/A2000 Workbench disk. Release 1.[illegible] ↵
version AS1*N"
Sys:System/FastMemFirst
BindDrivers
Setclock Load
FF >NIL: -0
resident CLI L:Shell-Seg SYSTEM pure add
resident c:Execute pure
resident c:Resident pure
resident c:CD pure
makedir ram:t
makedir ram:env
makedir ram:clipboards
assign T: ram:t
assign ENV: ram:env
assign CLIPS: ram:clipboards
mount newcon:
mount speak:
mount aux:
mount pipe:
Sys:System/SetMap gb
path ram: c: sys:utilities sys:system s: ↵
sys:prefs add
LoadWB delay
endcli >NIL:
```

Below: The table shows what the different logical device assignments which AmigaDOS makes during booting acutally point to.

Assignment:	Points to:
C:	The C (command) directory
DEVS:	The Devs (devices) directory
FONTS:	The Fonts (type styles) directory
L:	The L (handlers) directory
LIBS:	The Libs (libraries) directory
S:	The S (scripts or sequences) directory
SYS:	The root (first) directory
T:	The T (temporary) directory

Shell

phase, and it is this which will allow you to customise your startup to best suit your needs.

The original startup-sequence goes through no less than 37 separate steps including multi-tasking a second CLI – this is grossly inefficient and can be directly replaced with the listing on page 76. Before examining it step-by-step you can see the major change has been the removal of the 'StartupII' sequence (refer back to last month's column if you can't remember what StartupII did). It's still there, only it has now been added to the main startup-sequence script. For the sake of keeping things simple, this startup performs the same actions as the one supplied by Commodore but uses just 25 steps to do it. The version for 1Mb machines is stripped down even further and is not suitable for some types of expansion hardware. Here's how they work:

Improved 1.3 startup-sequence

1: Allocates 2.5K of memory for disk buffers for the internal drive.

2: Patches the system bugs. This must always be present!

3: Announces the Workbench disk. The version number has been changed here to indicate this is not a Commodore supplied startup. This line can be removed or edited to personalise each disk if required.

4: Configures EXEC to allocate Fast memory first if some is fitted. If you only have 512K (or less) or if you have 1Mb and a fatter Agnes this line can be discarded.

5: Attaches certain types of hardware to the system. If you need this command, there will be an icon or icons in the Workbench's Expansion drawer. If the expansion drawer is empty, this line can be safely removed.

6: Sets the system time and date from the real-time clock. If you have an A500 with only 512K or your expansion memory does not have a clock this line can be deleted. Note: a rare bug in the system fails to read the 'last used' time and date from some hard disks and this can cause curious bugs with commands such as DATE and LIST. If you have a hard disk attached and no real-time clock, use DATE instead. (Typically the format will be DATE 01-Jan-91).

7: Activates Charlie Heath's FastFonts program to speed up text flow in windows. This also gives you a chance to change the default system font, more of which shortly.

8: Loads the resident part of the Shell. This only makes the Shell available for later use – it has no effect on the current (startup) CLI.

9-11: Makes 'resident', 'execute' and 'cd' resident. The resident 'execute' is a hangover from the original startup and is preserved here for consistency.

12-14: Creates the T, Env and Clipboards directories in the ram: disk...

15-17: ...which are assigned to T:, ENV: and CLIPS: respectively here. T: is an automatic assignment and is placed in RAM: for speed of access. Note how the 'makedir's and 'assign's are grouped together to save on disk access even when a very small cache buffer is active.

18-21: Mounts 'newcon:', 'pipe:', 'speak:' and 'aux:'. The newcon: device is required for Shell windows – the others are application-specific but are retained for compatibility.

22: Changes the default keymap (keyboard layout) to mirror the setup on British machines. This command may be omitted in some countries, and other countries may require a different keymap.

23: Sets the default paths for the Shell so Workbench commands can be accessed easily.

24: Activates the Workbench with a short delay. This allows the disk activity (caused by ENDCLI loading) to complete before it starts looking for mounted disks.

25: Closes the default CLI window.

1Mb startup-sequence

In essence, the startup-sequence for 1Mb machines shown on the right is very similar to the first – except that this one works better on later machines with 1Mb or more fitted. In order to avoid needless repetition, let's just take a look at the changes:

1: The number of buffers allocated to the internal drive has been increased from 10 to 22. This speeds disk access a little during normal use, but has little effect on the startup.

2: SetPatch has had the 'R' option added. This is used to protect the RAD: (reset-proof RAM disk) device when the machine has a fatter Agnus and an A501 0.5Mb RAM expansion fitted. Also, the '>NIL:' sink has been removed so you can see exactly which functions have been patched.

3: As in step 2, the ">NIL:" display sink has been removed to allow FastFonts to display its copyright message. The reason for doing this will be discussed later.

continued on page 78

JARGON BUSTING

Devices – Software device drivers that provide a common interface between the Amiga's operating system and the external hardware. For instance, the serial interface is controlled by the 'serial.device', while the printer is controlled by the 'printer.device' and, usually the 'parallel.device' too. Devices are closely related to libraries (qv).

Fatter Agnus – Agnus is one of the custom chips that help to make the Amiga so special. The Fat Agnus is responsible for handling the display, among other things, and can only access 0.5Mb of RAM – the so-called Chip RAM. Later machines are sometimes fitted with the Fatter Agnus which supports a full 1Mb. (The A3000 has a Super Fat Agnus which can access no less than 2Mb of Chip RAM!)

Handlers – These are similar to device drivers but operate at a much lower level and are usually accessed by the 'mount' command via the Mountlist. Way too complex to worry about, handlers are responsible for such heady things as the RAM disk and extra filing systems.

Libraries – These are collections of functions to control various parts of the system and perform certain tasks. Many libraries are built in to Kickstart already, and the disk-based ones are provided as transient extensions – that is, they can be loaded and removed as required by the Amiga.

Wetware – A gross Americanism for the human brain.

A startup-sequence for 1Mb machines

```
1.  Addbuffers df0: 22
2.  SetPatch -R
    Sys:System/FastMemFirst
    Setclock Load
3.  FF -0
    resident CLI L:Shell-Seg SYSTEM pure add
    mount newcon:
    resident c:Resident pure
    resident c:CD pure
    makedir ram:t
    makedir ram:env
    makedir ram:clipboards
    assign T: ram:t
    assign ENV: ram:env
    assign CLIPS: ram:clipboards
    Sys:System/SetMap gb
    path ram: c: sys:utilities sys:system s:          ↵
    sys:prefs add
    LoadWB delay
    endcli >NIL:
```

continued from page 77

In addition to those fine adjustments, several commands have been removed completely. In particular, the 'speak:', 'aux:' and 'pipe:' devices are no longer mounted during startup. These are rarely used outside AmigaDOS and can be explicitly mounted if required. Also, 'BindDrivers' has been removed since it has no effect on most machines – likewise Commodore's copyright message.

GOT A PROBLEM, JOHN?

If you get stuck with AmigaDOS or if there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, no personal correspondence can be entered into. Desperate people with no regard for telephone bills can e-mail me on CIX as 'smidoid' or find me lurking in the 'amigashopper' conference.

DISK DRIVES...

Those two example startups are just provided to get you going. In practice, you can chop and change the startup-sequence at will to get the best from your machine and the peripherals attached to it. The two most common will be a second disk drive and, in the case of the A500, a RAM expansion.

If you use the external drive for extra commands or file storage then allocating some cache buffers will be an advantage. (Note that cache buffers will have no effect if you only use the external drive for launching applications. This is because the cache gets repeatedly filled with new data and never gets chance to hold anything.) The command to add for A500 and A2000/3000 machines respectively is:

```
ADDBUFFERS DF1: 20                    ↵
; Add some buffers for an A500
ADDBUFFERS DF2: 20                    ↵
; Add some buffers for an             ↵
A2000/A3000
```

You can add as many or as few buffers as you see fit, but values between 10 and 25 tend to give the best effect. Remember, too, that this RAM is taken from the free memory pool, so the more buffers you allocate, the less free memory you will have to work with. Cache RAM for the hard disks is controlled by the Mountlist – more of which in a later instalment of the series.

...DEVICES...

Amiga devices can be grouped into three basic types: physical hardware, software emulations and directory assignments. All devices have one thing in common – they are accessed by their name with a colon appended, so df0:, ram:, rad:, prt:, con: and fonts: are typical examples. Most devices can be written to, a few can be read from and some can be scanned (have directory listings taken of them).

Most devices are mounted (attached to the system) during the boot sequence long before AmigaDOS gets control, and some (hard disks under Kickstart 1.2, for instance) are mounted by BindDrivers. But several need to be explicitly mounted. For instance, if you intend to use the Shell you must mount the 'newcon:' device somewhere in the startup. The others listed here are optional and can usually be mounted later.

BLITS & BOBS

The startup-sequence can be stopped at any time you wish by holding down the [Ctrl] key and pressing [D].

AUX: Provides unbuffered serial I/O for read and write. AUX: can be used as a window parameter for NEWCLI and NEWSHELL to provide a simple form of multi-user system.

PIPE: Offers a simple FIFO piping system for passing messages between CLIs and can be used as a small temporary storage area.

SPEAK: Is a device entry to the Amiga's speech system. Copying text to this device is a simple way to make the Amiga talk.

...AND ASSIGNMENTS

The assigns are related to the devices because they work in much the same way – at least at CLI level. Three assignments are made in the 1.3 startup – T:, ENV: and CLIPS: and, although these are optional, it is a good idea to leave them as they are. Briefly here's what they do:

T: Is the most important of these three. It is used by EXECUTE to create the temporary command files used when parsing scripts. T: is often shared by script programs to store temporary variables and files.

ENV: Was introduced in the Workbench 1.3 release as a temporary measure to support environmental variables – the AmigaDOS equivalent of preferences. ENV: is not widely supported in software and can be used by user script programs.

CLIPS: Is reserved for the clipboard.device (located in the DEVS: directory) and is used as a temporary area for storing data cut by applications. This is supposed to be a shared area but the practice remains to be widely adopted. The idea comes from the Macintosh platform, where it works extremely well and is supported by virtually every application available. AS

SMIDDY'S RED HOT TIPS

This feature is all about startup-sequences, so it seems only right that the tips should be tailored to help you get the best from yours.

• First off, how many times have you mis-typed 'ED S:Startup-sequence'? This has to be one of the most difficult sequences of letters to get your pinkies round yet invented, so to kick off here are two ALIASes to get you going quickly. Add these to the Shell-Startup script (making sure you enter them correctly) and editing startups is a lot simpler:

```
ALIAS EDS ED S:Startup-sequence
ALIAS FRED ED DF[]:S/Startup-sequence
```

The first one, EDS, is used to edit the startup on the disk you booted from and this is the one you'll probably use most – just type EDS to get going. The second one, FRED, is useful for editing the startup on other disks. To use it just type FRED and the number of the drive whose startup you want to edit – for example,

```
FRED 1; edit startup on drive one
```

• To get the best effect from FastMemFirst, you will need to know if you have a Fatter Agnus or a plain old Fat one. Assuming you have at least 1Mb of RAM (Fatter Agnus makes no difference on 0.5Mb machines) you can use the AVAIL command to find out. AVAIL is used to determine the amount and fragmentation of the current memory but for our purposes we need to know how much Chip RAM is fitted. AVAIL has the following synopsis:

```
AVAIL [TOTAL|CHIP|FAST]
```

This means that the command can take either no options or any one of the three switches ('TOTAL', 'CHIP' or 'FAST'):

TOTAL: The total amount of memory currently available.
CHIP: The total amount of Chip memory currently available.
FAST: The total amount of Fast memory currently available.

A word of caution here. Because of the multi-tasking nature of the machine, where memory is constantly being allocated and freed, AVAIL only supplies an instant 'shapshot' of the memory available at any one time and should only be used as a guideline.

Used without arguments, AVAIL supplies the most useful information. Typically, when used in this way the AVAIL command behaves in the following way:

```
AVAIL
Type    Available   In-Use    Maximum    Largest
chip    396328      126904    523232     385112
fast    2344216     269792    2614008    1933352
total   2740544     396696    3137240    1933352
```

This machine is an A500 fitted with 3Mb of RAM but the old (Fat) Agnus chip. The values to watch are the maximum amounts of Chip and Fast memory. If the machine is fitted with a Fatter Agnus and a trapdoor RAM expansion there would be approximately twice as much Chip RAM listed. Similarly, if the machine is fitted with 1Mb and a Fatter Agnus there will be no Fast RAM available.

The plot thickens...

In this, part four of his series on building an Amiga application in C, Sam Littlewood connects ADraw to some screen pixels that are of the program's own making rather than Intuition's

> "Here we are again... So far *ADraw* is a reasonably complete program from the windows, menus and gadgets point of view, but it is a little lacking in guts. What we need to do is add some drawing routines to the basic frame. Read on..."
> Sam Littlewood

The drawings handled by ADraw are made up of various components, or elements. There are five types that will be added at this stage: boxes, circles, lines with multiple points, text strings, and groups of the above.

These elements and their implementation are not designed to be all-encompassing; rather, they are intended to make the addition of further, possibly complex, graphic types easy to do.

Each top-level element associated with a project is hooked to a list in the Project structure. This list is maintained via the exec.library list functions. Each graphic type has some data that is unique to an element of that type. These structures are shown in Listing 1.

The structures in themselves do not provide nearly enough information to start constructing a picture. Things like the position and colour are missing, as well as the information to thread copies of the elements together in memory while they are attached to a project. Since this sort of information is pretty much common to all the various element types, it is created as a 'wrapper' around the above structures (see Listing 2).

The Element structure has the ubiquitous MinNode at the front, which provides the support for doubly linked lists. The colours and drawing style are stored in terms of the values to pass to the Amiga graphics.library. Before the element is drawn, the values are simply passed to the appropriate graphics.library functions. This is convenient for the moment and things can be got up and running quickly. It is, however, earmarked as an area to return to in the future for the following reasons:

> "Rewriting a feature ten times rather makes it lose its appeal!"

- It does not represent what might be possible with printers, such as varying line styles and fill patterns.
- It does not (easily) allow any of our own styles to be added in at a later date by just adding self-contained code. One such example would be varying the thickness of lines.
- The #defined numbers for each element type do not use 0. The reason for this is one of debugging, since omitting to fill in the type somewhere in the program will leave the type member of the element obviously invalid, prompting further investigation, rather than an apparently correct, but actually bogus, value.

Elements are created with the general routine CreateElement(), shown in Listing 3. This allocates a new block of memory to hold the element, fills some default values, and sets the position. In addition it can optionally link this new element on to a given list.

The type-specific initialisation in CreateElement() is one aspect of the way in which many different types of element are handled by a small

continued on page 83

LISTING 1 • LISTING 1 • LISTING 1

```
/* Structures to encapsulate the data particular to each element ↵
type
*/
struct BoxInfo {
        /* Size of box in project units
        */
        long width;
        long height;
};
struct CircleInfo {
        /* Radius of circle in project units
        */
        long radius;
};
struct LineInfo {
        /* An exec list of the points on the line. Each element
        * of this list is a 'LinePoint' structure.
        */
        struct MinList points;
};
struct TextInfo {
        /* Pointer to an AllocMem'd block of memory containing
        * the string, including '\0' byte at end.
        */
        char *text;
        /* length of above memory block
        */
        int text_length;
};
struct GroupInfo {
        struct MinList elements;
};
```

LISTING 2 • LISTING 2 • LISTING 2

```
* The structure that makes up the individual elements of a project
*/
struct Element {
        /* Node used to link element on to
        * project or group element list.
        */
        struct MinNode node;
        /* The particular type of this element
        */
        int type;
        /* Position in project units
        */
        long x;
        long y;
        /* Rendering information
        */
        char fg_colour;              /* Used for SetAPen() */
        char bg_colour;              /* Used for SetBPen() */
        char outline_colour; /* Used for SetOPen() */
        int draw_mode;               /* Used for SetDrMd() */
        /* The data for the particular type of primitive
        *
        * Each variant of the data is overlaid
        * into the same area of memory.
        */
        union {
        struct BoxInfo box;
        struct CircleInfo circle;
        struct LineInfo line;
        struct TextInfo text;
        struct GroupInfo group;
        } e;
};
/* The possible values for Element.type
*/
#define ELMT_BOX        1
#define ELMT_CIRCLE     2
#define ELMT_LINE       3
#define ELMT_TEXT       4
#define ELMT_GROUP      5
```



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LISTING 3 • LISTING 3 • LISTING 3

```
/* CreateElement
 *
 * Allocate a new element of the specified type and possibly
 * attach to the given list.
 *
 * The generic element structure is allocated and filled in,
 * then a type specific function is called to initialise
 * the rest of the structure.
 */
struct Element *CreateElement(struct MinList *list,int type,long x,long y)
{
        struct Element *element;
        element = AllocMem(sizeof(*element),MEMF_CLEAR);
        if(element == NULL) AllocError(AE_ELEMENT);
        /* Fill in provided information
         */
        element->type = type;
        element->x = x;
        element->y = y;
        /* Some default colours and styles
         */
        element->fg_colour = 2;
        element->bg_colour = 1;
        element->outline_colour = 0;
        element->draw_mode = JAM2;
        /* If there is a special case initialisation function
         * for this type, call it with the pointer the newly
         * created element.
         */
        if(ElementActionsTable[type].initialise)
          (*ElementActionsTable[type].initialise)(element);
        /* If list argument is non-null, then
         * add this element to that list.
         */
        if(list) ADDTAIL(list,element);
        return element;
}
```

LISTING 5 • LISTING 5 • LISTING 5

```
/* LineInit
 *
 * Special case initialisation for a
 * line - make the points list be empty.
 */
void LineInit(struct Element *element)
{
        NEWLIST(&(element->e.line.points));
}
/* GroupInit
 *
 * Special case initialisation for a
 * group - start with empty element list.
 */
void GroupInit(struct Element *element)
{
        NEWLIST(&(element->e.group.elements));
}
```

continued from page 81

amount of code. As with the data describing the elements, the actions to handle elements are split into two types: general code appropriate for any element, and code that is specific to one type. This fact could be totally ignored and a whole slew of routines written – CreateBox(), CreateCircle() and so on. But this is possibly the worst idea, since some change to the way in which general element handling is done will lead to tedious work as the change is propagated though all the identical bits of code in each routine – there's nothing like rewriting a new feature 10 times to make it lose its appeal!

A more acceptable solution would be to have a routine like CreateElement() that does all the general initialisation, but then has a big 'switch()' statement on all the various element types at the end:

```
/* General Initialisation */
...

switch(element->type) {
case ELMT_BOX:
  /* Initialise a box */
  ...
  break;

case ELMT_CIRCLE:
  /* Initialise a circle */
  ...
  break;
...
}
```

This can still result in some rather tedious and error-prone editing when the number of routines that have this mix of general and specific increases – DeleteElement(), DrawElement(), SelectElement() and so on. Each of these routines has to be sorted out, possibly in widely separated files.

The method that ADraw uses is to have a program-wide table with an entry for each element type. The entries in the table are a structure of pointers to functions – the specific bits of code for various actions. If there is no action required, then the associated pointer is NULL. This rather important table is called ElementActionsTable (see Listing 4). CreateElement(), having done the general initialisation, looks in ElementActionsTable, given the type. The particular part of the type entry it is interested in is a member called 'initialise'. If it is not NULL, initialise points at a routine to use for the remainder of the initialisation.

There are various other special case routines, to dispose of the element, for example, or to draw the element and to draw 'select' highlighting for the element.

The two element types that need special initialisation are lines and groups. Both these types are based on a list. Lines have a list of points, groups have a list of sub-elements. The associated initialisation functions, detailed in Listing 5, simply set up these lists to their empty states.

The 'Text' type is peculiar in that it does not have an initialisation function, but does have a deletion function. This is because the Element block is allocated with MEMF_CLEAR, and is all zeros. As a result of this, new Text elements get a text length of zero and a NULL text pointer. This is exactly what is needed for a Text item that has not had any text filled in yet. When the time comes to delete a Text element, there now needs to be a special case delete routine to free up the associated string.

This scheme only scratches the surface of the range of solutions to the problem of wrapping up special cases of general types in a clean way. There are more general, but more complicated ways. One could

continued on page 84

LISTING 4 • LISTING 4 • LISTING 4 • LISTING 4

```
/* There is a global array of these structures,
 * containing useful information and function
 * pointer particular to each element type.
 */
struct ElementActions {
        /* If non NULL, a function pointer
         * to call during element creation.
         */
        void (*initialise)(struct Element *);
        /* If non NULL, a function pointer
         * to call during element deletion.
         */
        void (*delete)(struct Element *);
        /* If non NULL, a function pointer
         * to draw the one these elements.
         */
        void (*draw)(struct DrawInfo *, struct Element *);
        /* If non NULL, a function pointer
         * to draw the select highlighting
         * for one of these elements.
         */
void (*draw_select)(struct UserWindow *, struct DrawInfo *, struct Element *);
        /* Other special case entries
         * ...
         */
};
/* An array of information about each element type.
 */
struct ElementActions ElementActionsTable[] = {
/* Type         Init            Delete          Draw            DrawSelect      ... */
/* NULL   */    {0},            /* Type 0 does not exist */
/* BOX    */    {NULL,          NULL,           BoxDraw,        BoxSelect       },
/* CIRCLE */    {NULL,          NULL,           CircleDraw,     CircleSelect    },
/* LINE   */    {LineInit,      LineDelete,     LineDraw,       LineSelect      },
/* TEXT   */    {NULL,          TextDelete,     TextDraw,       TextSelect      },
/* GROUP  */    {GroupInit,     GroupDelete,    GroupDraw,      GroupSelect     },
};
```

LISTING 6 • LISTING 6 • LISTING 6

```
...
case MIEDIT_ZOOMIN:
/* Increase magnification of window
*/
if(uw->scale_x >= MIN_ZOOM*2 && uw->scale_y >= MIN_ZOOM*2) {
        uw->scale_x /= 2;
        uw->scale_y /= 2;
        /* Update the window
        */
        DrawWindow(uw,0);
        }
        break;
        case MIEDIT_ZOOMOUT:
        /* Decrease magnification of window
        */
if(uw->scale_x <= MAX_ZOOM/2 && uw->scale_y <= MAX_ZOOM/2) {
        uw->scale_x *= 2;
        uw->scale_y *= 2;
        /* Update the window
        */
        DrawWindow(uw,0);
        }
        break;
        ...
```

LISTING 7 • LISTING 7 • LISTING 7

```
/* Structure describing where and at
* what scale to draw something.
*/
struct DrawInfo {
        /* The RastPort to draw into.
        */
        struct RastPort *rp;
        /* x,y offset within that rastport
        * for window origin.
        */
        int origin_x;
        int origin_y;
        /* x,y offset in project space.
        */
        long view_x;
        long view_y;
        /* Scale, in project units per pixel, both axis.
        */
        long scale_x;
        long scale_y;
};
```

LISTING 8 • LISTING 8 • LISTING 8

```
/* RenderProjectWindow
*
* Draw the current view of a project into
* draw area of the window attached to a
* given UserWindow.
*/
void RenderProjectWindow(struct UserWindow *uw)
{
struct DrawInfo draw_info; /* NB: Actual structure, not a      ↵
pointer */
        struct Element *element;
        /* Fill in draw)info from UserWindow
        */
        draw_info.rp = uw->window->RPort;
        draw_info.scale_x = uw->scale_x;
        draw_info.scale_y = uw->scale_y;
        draw_info.view_x = uw->view_x;
        draw_info.view_y = uw->view_y;
        /* The window origin is in the middle of the draw area.
        */
        draw_info.origin_x = (uw->draw_rect.MinX+uw-            ↵
>draw_rect.MaxX)/2;
        draw_info.origin_y = (uw->draw_rect.MinY+uw-            ↵
>draw_rect.MaxY)/2;
        /* Walk along the elements of this project.
        */
        for(element = HEAD(&uw->project->elements);
        NEXT(element);
        element = NEXT(element))
        DrawElement(&draw_info,element);
}
```

continued from page 83

move to a newer (but less well-supported) language that has more direct support for the goals. The far reaches of this scale include writing special purpose languages particular to the application. Trying to build such an ultimate system can, however, lead to a development time scale specified in geological terms before anything actually works!

ELEMENT LOCATION

Various pieces of code mentioned above have referred to 'project space' and 'project units'. The position and size of elements within a project are kept in rather abstract units, a long integer for (x,y). The project can be thought of as an immense piece of graph paper ranging about two million squares up, down, left and right from the origin. This is what gets called 'project space'. The squares are 'project units'.

All elements in the project are placed and sized using project units in project space. The Amiga screen co-ordinates have absolutely nothing to do with the accuracy of how the elements are placed and sized – they only get involved when the project is being drawn or a mouse click is converted to the corresponding place in project space.

How the Amiga screen and mouse position relates to project space is individual to each window on to the project. The information is stored in the UserWindow structure:

```
...
/* Position in project
 * space of the window
 * centre.
*/
long view_x;
long view_y;

/* The number of project
 * units to a screen pixel
 * in each axis should be
 * a power of 2.
*/
long scale_x;
long scale_y;
...
```

These structure members describe, for each window, where it is in its associated project and how much of the project is visible within the window. The scroll bars around the draw area will modify view_x and view_y, whereas the Zoom In and Zoom Out menu entries will change scale_x and scale_y. The entries in the menu 'switch' statement for Zoom In and Zoom Out are shown in Listing 6.

This zooming works well, but it does have its limitations. It only works in powers of two; the sizes are doubled or halved each time. Any other scales will tend to get lost, especially if the view is zoomed all the way in and out.

A possible extension is to keep a separate floating point aspect ratio for the current screen. The scale number becomes one value, rather than separate ones for x and y. This number is used directly when scaling in the x direction, but is multiplied by the aspect ratio when scaling in the y direction is required. This has been avoided for the moment because of the potential introduction of floating point calculations.

All the routines that can draw project elements take a pointer to a structure called DrawInfo. This structure contains the various scaling and origins that are needed to map the project on to the screen, along with the RastPort to draw into. (A RastPort is a graphics.library structure used to describe a chunk of the screen). This may seem strange, since all the scaling and position information can be dug out of the UserWindow structure – and indeed, for screen updates the DrawInfo structure has a direct copy

continued on page 86

LISTING 9 • LISTING 9 • LISTING 9

```
/* DrawElement
*
* Setup graphics.library with colours
* and draw mode for this element and
* then call a special case drawer.
*/
void DrawElement(struct DrawInfo *di, struct Element *element)
{
/*
        * Set up the basic drawing information from the element.
        */
        SetAPen(di->rp,element->fg_colour);
        SetBPen(di->rp,element->bg_colour);
        SetOPen(di->rp,element->outline_colour);
        SetDrMd(di->rp,element->draw_mode);
        /*
        * Do the type specific drawing
        */
        if(ElementActionsTable[element->type].draw)
        (*ElementActionsTable[element->type].draw)(di,element);
}
```

continued from page 84

of much of that information. It would appear to be far easier to pass a pointer to the UserWindow structure down to all the graphics drawing routines and save the hassle of copying data around.

The reason for the extra effort is a bit of forward planning. So far, all graphics have been drawn to something that has an associated UserWindow, that being a real Intuition window. There is one case, though, where this will not be true – and that is printing.

Printing a project out using the Amiga libraries and printer drivers involves building an off-screen image of what the page will look like, then sending this to the operating system, which then does the appropriate printing. The off-screen image is accessed through a RastPort structure, just like an on-screen bitmap. The scaling and position information used for viewing is just as useful for printing; it can be used to get the project drawn at a decent resolution and at the correct position and size on the printed page.

A further use for this design is that of generating IFF picture files of the project. This will work in exactly the same way as printing, but instead of the off-screen bitmap being sent via the operating system to the printer, it is sent to a file. Listing 7 shows the DrawInfo structure. For screen updates, one of these is filled in and used by RenderProjectWindow() in Listing 8.

The Intuition event loop maintains a Rectangle structure within each window's UserWindow structure. This contains the limits of the main drawing area. (This Rectangle is also used to manipulate the clipping via the layers.library, ensuring that only the main drawing area will be rendered into.) RenderProjectWindow() uses this rectangle to find the centre of the draw area by averaging the two corners. This centre point in the windows corresponds to the view_x, view_y position in the project.

Having generated the DrawInfo structure, the list of the project's elements are traversed, calling the general element draw routine for each one. DrawElement() (Listing 9) sets up the colours and then digs around in the array 'ElementActionsTable' to find a special case routine for drawing this type of element.

The special case drawing routines are where, finally, pixels get set on-screen. They are given a pointer to a DrawInfo structure and to the element, and they must then convert the project space sizes and positions to screen values using the information in the DrawInfo. Since this conversion is going to be rather common some macros, detailed in Listing 10, come to the rescue.

LISTING 10 ● LISTING 10 ● LISTING 10 ● LISTING 10

```
/* Convert project x (px) to screen x position via a DrawInfo structure (di)
*
* (proj_x - view_x)/scale_x + origin_x
*/
#define SCREEN_X(di,px)    (((px) - (di)->view_x)/(di)->scale_x + (di)->origin_x)
/* Convert project y (py) to screen y position via a DrawInfo structure (di)
*
* (proj_y - view_y)/scale_y + origin_y
*/
#define SCREEN_Y(di,py)    (((py) - (di)->view_y)/(di)->scale_y + (di)->origin_y)
/* Convert project x (sx) to screen x size via a DrawInfo structure (di)
*
* size_x/scale_x
*/
#define SCREEN_XSIZE(di,sx) ((sx)/(di)->scale_x)
/* Convert project x (sx) to screen x size via a DrawInfo structure (di)
*
* size_y/scale_y
*/
#define SCREEN_YSIZE(di,sy) ((sy)/(di)->scale_y)
```

Apart from the maths, these macros have a feature that should be present in all macros – the heavy use of brackets. The whole macro has brackets around it, and each instance of an argument in the substitution text to the right also has brackets around it. This seemingly pedantic method is used to combat a feature of the way macros are handled.

Macro processing works much like a text editor. All #defines and #includes are pre-processed in the input text file, and a new bunch of text is spat out, which is then fed to the compiler proper. The pre-processor knows nothing of C, it simply spots lines beginning with a '#' character and follows the instructions therein. To give an example of where the preprocessor might cause trouble:

```
#define DOUBLE1(x) x+x
#define DOUBLE2(x) x*2
...
i = DOUBLE1(4); /* i = 8 */
i = DOUBLE2(3); /* i = 6 */

i = DOUBLE1(4)*2; /* i = 10 ↲
?? */
i = DOUBLE2(1+2);/* i = 5 ↲
?? */
```

The strange results can be explained by looking at what the pre-processor generates as input for the compiler proper:

```
i = 4+4; /* i = 8 */
i = 3*2; /* i = 6 */

i = 4+4*2; /* i = 10 */
i = 1+2*2; /* i = 5 */
```

To get the above macros to act correctly in all situations, some brackets must be added to keep the compiler in step with what is required:

```
#define DOUBLE1(x) ((x)+(x))
#define DOUBLE2(x) ((x)*2)
```

If you do suspect that the pre-processor is causing problems, then it is possible to take a look at what it is feeding the compiler by giving an appropriate flag (in Lattice C, for example, use 'lc -p file.c').

Having explained the ugly macros in listing 10, and why they are quite so ugly, they actually turn out to be easy to use, as can be seen in the last piece of code for this month, Listing 11.

The only complication here is to make sure that the graphics.library function RectFill() gets given its arguments the correct way around. After all that, ADraw can actually display the data it has got tucked away in memory.

Next month we will be printing the final article in this C programming series. It will fill in some holes in the explanations so far, and suggest some possible routes which you might like to take in order to expand the project. AS

LISTING 11 ● LISTING 11 ● LISTING

```
/* BoxDraw
*
* Raster rending of a box element
*/
void BoxDraw(struct DrawInfo *di, struct Element *element)
{
        int xmin,xmax;
        int ymin,ymax;
        int t;
        /* Work out screen area of box
        */
        xmin = SCREEN_X(di,element->x);
        ymin = SCREEN_Y(di,element->y);
        xmax = SCREEN_X(di,element->x+element->e.box.width);
        ymax = SCREEN_Y(di,element->y+element->e.box.height);
        /*
        * make sure the max/mins are the right way around
        */
        if(xmin > xmax) {
        t = xmax; xmax = xmin; xmin = t;
        }
        if(ymin > ymax) {
        t = ymax; ymax = ymin; ymin = t;
        }
        /*
        * Draw the result
        */
        RectFill(di->rp,xmin,ymin, xmax,ymax);
}
/* CircleDraw
*
* Raster rending of a box element
*/
void CircleDraw(struct DrawInfo *di, struct Element *element)
{
        DrawEllipse(di->rp,
SCREEN_X(di,element->x),SCREEN_Y(di,element->y),/* Centre */
SCREEN_XSIZE(di,element->e.circle.radius), /* X radius */
SCREEN_YSIZE(di,element->e.circle.radius) /* Y radius */
        );
}
```

The Beer Test

Last month Mark Smiddy introduced a real-world trial of Superbase which he called 'The Beer Test'. Here he shows how to construct such a survey

Business software can be a drag to use and rather dull to read about – especially when the example data is contrived to fit a specific application. This feature is intended as a launch pad for your own ideas, while testing real software with real data to discover how it performs. The 'Beer Test' presented here is the one introduced in last month's column – a real-world case study using data gathered from real people in a real place. Although some of the details have been changed (to protect the innocent, you might say), the figures are consistent.

The majority of this article is concerned with the how and why of conducting a computer-aided survey. The Amiga is an essential part of the process, with a database to compile and categorise the raw data and a spreadsheet to graph the results. Eventually, therefore, we can arrive at a set of conclusions derived from computerised analysis of the figures.

THE TRIAL

The synopsis: the Secretary of a local sports club, Redcar, approached me a few months ago. He was interested in performing a survey of his members to discover what they like about the club and, more to the point, what they don't like. The club has a membership of around 3,000, with a core of about 400-500 regular users.

I agreed to help with this, and we discussed exactly how we could get a 'valid' set of results out of the whole exercise. We came up with the following observations and methodology:

To get a fair assessment of what people want you must ask a reasonably sized cross-section of that membership (statisticians call it a population) for their opinion. Next, analyse the distribution according to various factors – for example, the percentage of population drinking various beers/lagers. (This analysis is said to be of a 'discontinuous population' because there are only a limited number of possibilities). In any event, the larger the population is, the more accurate the figures are likely to be.

For this test, the management team decided that over 20 per cent of the core membership (over 100 members) would represent a fair assessment. So, before going any further, here is something to help you judge the scale of the task. Over a two week period, 181 completed forms were collected, with only eight damaged or destroyed. This far exceeds the required return and is excellent, considering the form had nearly 300 possible entries in over 80 categories. However, it should be said that several areas of the form were less than perfectly designed – thus exacerbating the problem for the designer. Not to mention my two data clerks, who were on work experience loan from a local school!

BLITS & BOBS

"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write." – H G Wells.

So here, then, is how we set about the task – from conception through design to implementation of the survey and analysis of the results.

CONCEPTION

T minus 28 days

At one of its regular meetings, the (voluntary) management committee of Redcar Sports Club decided that it would be a good idea to go to its membership and ask for their opinion on how the club should be run. The problem was simple: increases in VAT and excise duty had made the cost of social drinking greater. This had been indirectly aggravated by other recent price increases and changes in the selection of drinks on offer at the club.

Influences outside the control of the club are also changing the way people spend their leisure time and therefore, if the club was to survive, radical changes would have to be made: but what? This situation is by no means unique. Changes in the British lifestyle and working habits over the last 10 or 20 years have proved this beyond doubt, so pub landlords, and indeed any retail business, can study the lessons learned here.

DESIGN

T minus 21 days

Designing a form such as this requires a lot of careful thought if the information received is going to make any sense whatsoever. An old computer saying, GIGO (garbage in, garbage out), holds just as true today as it did when it was first coined. This is also the first hurdle: you have to know what answers you want before you ask the questions but, more importantly, you have to avoid 'loading' the questions or the results will be just as useless. Consider this: let's imagine that in a recent speech Neil Kinnock has said that the Labour Party plans to raise income tax in order to improve the National Health Service. Here is a blatant example of how the wording of a question can load a public opinion survey:



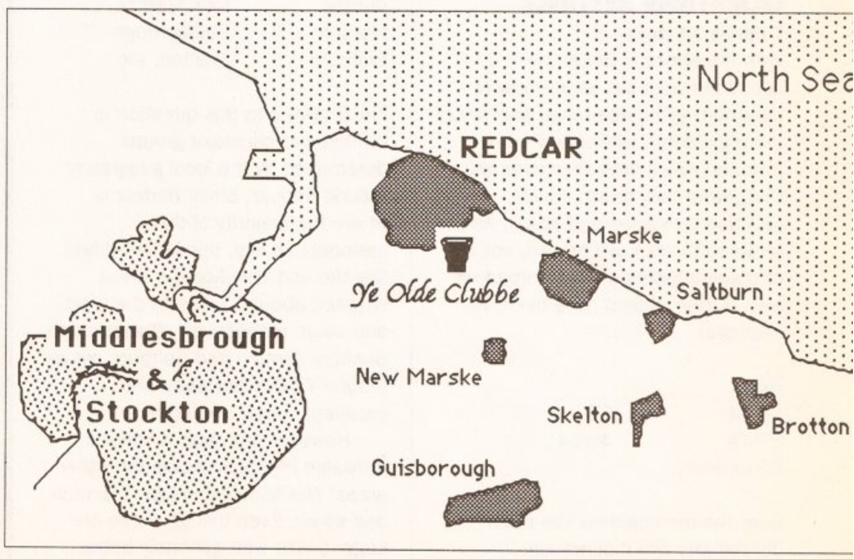
"Just how do age, peer group and occupation affect people's social behaviour? Let's find out how the computer can help decide..."
Mark Smiddy

Question A:
"Mr Kinnock said recently that a Labour government will raise taxes. How will you vote?"

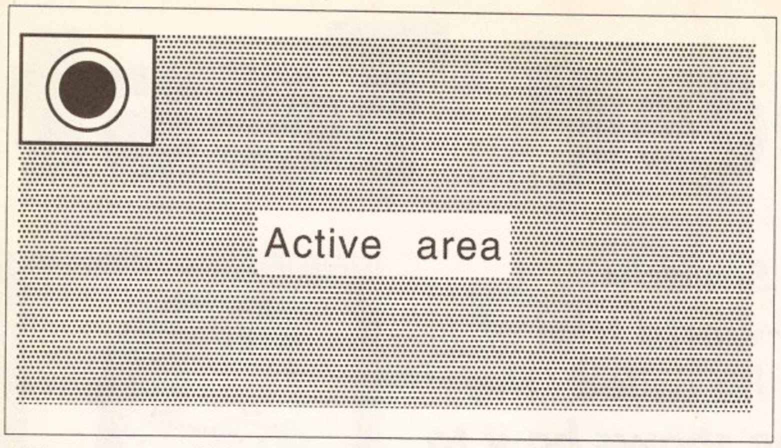
Question B:
"Mr Kinnock said recently that a Labour government will improve the NHS. How will you vote?"

Of course, I'm not about to point fingers at reputable polling firms – this just serves to illustrate the point. In The Beer Test, it would be pointless to ask lager drinkers how often they drink bottled stout. By doing so it would be easy to prove that bottled stout is a non-starter,

continued on page 88



Cleveland used to be part of North Yorkshire and still retains many of the rural elements of that great county. A large number of the workforce still rely on two large ICI complexes and the British Steel plant situated between Redcar and the Middlesbrough conurbation. (This map is only roughly to scale.)



Active areas can only be expanded below and to the right of check boxes and radio buttons, which can give rise to clumsy layouts.

continued from page 89

hence Disraeli's famous missive: "There are three kinds of lies: lies, damned lies and statistics."

Similarly, a human population tends to be biased in itself. In The Beer Test it is almost impossible to determine what makes people join the Redcar Sports Club because the survey is only being conducted among existing members. Even with this taken into consideration, fairly accurate statistical results must be used with care; as Andrew Lang once said, "He uses statistics as a drunken man uses a lamppost – for support rather than illumination". Particularly apt in this case...

WHOOPS!

Sorry, I didn't mean to say that. A slight error turned up in last month's copy: *Superbase 4*'s DML does not feature the REPEAT...UNTIL construct.

QUESTION SETTING

T minus 14 days

With the above in mind, the questions were set with a view to determining the age range and sex of the population, where they came from, on which days they used the Club, what they drank, which facilities they used and so on. As the returned forms have proved, not all of these questions were worded as well as they should have been. For example:

Age

18-24	☐	25-34	☐
35-44	☐	45-54	☐
55 or over	☐		

Here the membership has been divided into five distinct age categories. This will help determine the statistical type of people being attracted. The youngest group (18-24) are the first-time drinkers – young men and women with lots of disposable income. The next group up (25-34) will be those just starting families, buying their first home and so on; they are likely to have much less disposable income than their younger peers. Moving to the 35-44 year age range we find parents of older youngsters on their second home, perhaps where the wife has returned to work.

In the 45-54 year age range there may be a slight anomaly – biased mainly by Redcar's location in the far north-east of England. Typically here, women of this age are not expected to work at all – not even part-time. Also, although any children will have grown up and left home, and mortgages will have been paid off, this group will have less disposable income than the previous group. This also applies to the over 55s, where people are reaching retirement and tend towards a more relaxed lifestyle. The latter group also includes full pensioners.

Another example:

Where you live

Redcar	☐	New Markse	☐
Marske	☐	Guisborough	☐
Saltburn	☐	Skelton, etc	☐

The answers to this question is divided into six major groups determined by the local geography around Redcar. Since Redcar is where the majority of the membership live, this is listed first. Marske and New Marske are a situated about 2 miles to the west and south respectively. Guisborough, Skelton, Brotton and Saltburn are all around 7-10 miles away with excellent communications.

However, the fault is that no provision has been made for 'other areas' like Middlesbrough, Stockton and so on. Even though these are larger towns with generally better facilities than the rural communities around Redcar, some people may come from there for special events. The same also applies to the questions on profession – here there was no provision for housewives or, again, an 'other' category.

Worst of all, two categories included a 'Never' check box which should have read 'Don't know'. These mistakes (which were entirely mine) are painfully obvious when pointed out. However it went unnoticed by the whole team – which included a retired maths teacher – until one of the people surveyed pointed it out! There is a lesson here: we tend to put too much reliance on experts and often forget to use our own judgement. This extends to the machines: learn to question the results, because computer operators have been known to make mistakes.

Camera-ready artwork was laser printed on a Macintosh SE from a Microsoft *Word* document. An Amiga running a similar system, *Pagestream* or *ProPage* for instance, could have been used and would have done the job just as well. This was then despatched to a local printer for production on double-sided A4 copier paper. Accounting for materials and external costs the whole job came in at under £40 for 500 sheets – affordable even for a small business.

This phase of the survey was the last one to involve the club itself. Blank forms were distributed over a 14 day period (Sunday to Sunday) to allow people enough time to complete and return them. Altogether, just under 250 forms were distributed and 173 were returned complete and undamaged.

DATABASE DESIGN

During this time, The Beer Test entry forms were being designed on *Superbase Professional 4*. In order to avoid contravening the Data Protection Act, no space exists on the database for people's names or membership numbers. In this way the data is for a statistical population and not 'people' as such. (If you intend keeping any personal records on computer you must register with the Data Protection Registrar beforehand.)

Designing a database to store information such as this offers some interesting problems – chiefly multiple choice lists. Consider the example earlier where respondents are asked for their age. In the database this can be represented by a single field with any one of five different values. For a conventional database, this value must be entered manually by a clerk – usually using a master template:

Age

18-24	☐ (1)	25-34	☐ (2)
35-44	☐ (3)	45-54	☐ (4)
55 or over	☐ (5)		

Here, the clerk can cross reference the age to a value and enter it

LISTING 1 • LISTING 1 • LISTING 1

```
OPEN FILE "CLUBDATA"
REPORT SUMMARIZE
HEADING
? @9;"Male usage by Age range":?
? @27; "Number";@37;"Percentage"
? @27; "======";@37;"=========="
END HEADING
GROUP Age
 BEFORE GROUP Age
 SELECT CASE Age
  CASE "1":a$ = "18-24"
  CASE "2":a$ = "25-34"
  CASE "3":a$ = "35-44"
  CASE "4":a$ = "45-54"
  CASE "5":a$ = "55 or over"
 END SELECT
 END GROUP
 AFTER GROUP Age
 ? "Total number ";a$;@25&]4; COUNT ;@35" (";&]2; COUNT /  ↵
RECCOUNT ("") * 100;"%)"
 END GROUP
SELECT ;
ORDER Age ASCENDING
WHERE Sex = "M"
END SELECT
```

This typical report program was generated by the forms editor and then finished off by hand. A lot more 'touching-up' could be applied to improve the final output, such as centring the title for instance.

	Bar	Lounge	Concert Room	(Regularly)
Sunday	☐	☐	☐	☐

Above and right: wanting to have several different categories can lead to the database needing a large number of fields.

	Fields	Validations	Values	Objects
Member type	1 text	Required	3	Radio buttons
Age group	1 text	Required	5	Radio buttons
Profession	1 text	Required	11	Radio buttons
Daily usage	7 + 7 text	None	3 + 1	Radio + check
Activities used	23 + 23 text	None	2 + 2	Radio buttons
Preferred drinks	13 text	None	4	Radio buttons
Scores	16 numeric	None	1	Fields

directly. This approach suffers from two distinct problems: it's very slow and, more importantly, because it relies on the typing accuracy of the clerk it's extremely prone to human error. Errors of this sort are extremely difficult to spot and can give rise to dramatic inaccuracies in the final figures.

One solution would be to have two clerks, on two machines – one entering data and the other checking it. But this would need either constant swapping of disks or networked computers. Another option would be to use a separate database accessed under program control which could present a list of possible entries in a menu. *Superbase Professional* (and some PC-based systems) have a facility to do this (or something like it) already.

Superbase Professional 4 supports a facility for this in its form-based radio buttons. These allow multiple choice data to be entered easily and automatically – thus reducing the possibility of errors to a minimum. A good facility of radio buttons is the option to extend each button's active area (see the diagram on the previous page), which allows the clerk to enter data by just clicking on the selection. However, the area can only be extended below and to the right of the original point. Why is this a problem? Well, we read from left to right, and therefore it is better to have the tick box to the right of each choice – otherwise you would have to read the selection and go back to the box.

Field validation can be used to ensure that data is actually entered when required. This revealed another unwelcome feature to the list of problems I was compiling for Precision, the company which produces *Superbase* – validations are only made when the form is completed. If an error occurs, for example if an input has been missed, the clerk has to manually navigate to the source of the error.

This problem can, in theory, be caught by DML (the database management language). But that requires logic to work out whereabouts on the form the offending field, button or check box is. Also, since radio buttons cannot be 'undone', optional groups require either a cancel button or a DML-controlled clear button in case of error.

Returning to the form, there are some areas where more than one response is required. For example, for the attendance I wanted to be able to separate the regular users from the occasional users. Regular is defined here as using the club on any day twice a month or more.

Taking the whole week into account, this requires a total of 14 fields. Seven are used for the days a person attends any room (any one of the three – this is a radio button group). The other seven are used for the 'Regular' option, and these are defined as check boxes. When the reports are being compiled, these two fields can be tied together – the regular field is used as a filter when appropriate. To summarise all of this, the file is constructed with fields as shown in the table at the top of the page.

In order to save space, most of the text fields are only one character wide. This is translated into more readable information by the reporting programs and is easier to test for in filters. This also ensures a certain amount of data security because without the form and reporting programs, the data is all but meaningless.

MALE USAGE BY AGE RANGE

	Number	Percentage of total membership
Total number 18-24	7	(4%)
Total number 25-34	9	(5%)
Total number 35-44	15	(9%)
Total number 45-54	29	(17%)
Total number 55 or over	30	(17%)

When properly set up, a database can produce useful results.

The only likely source of confusion in the table above are the values. The figures shown represent the number of possible choices stored in each field. For instance, the 'member type' field has one of three values determined by a radio button. Similarly, daily usage is split: seven fields with any one of three values each (representing the rooms) and seven fields with one value set for regular users.

Once the file had been constructed, the form was created; and what should have been a fairly simple, if laborious, task turned out to be a nightmare. My experiences creating this particular form led to my conclusions on *Superbase Pro 4* last month. (Since then I have had another update of *Superbase* and can report that at least some of the bugs are now fixed.)

STATISTICAL STUFF

As the saying goes, a picture tells a thousand words. (If that's true then the art room can compress this article into three drawings and I'm out of a job!) Flippancy aside, statistical data mapped on to a graph can say much more about trends than pure figures. Most databases have some sort of reporting facility built in, although *Superbase* has the best on the Amiga. Even so, very few databases have the capability to produce graphics based on those results. For this task I have chosen Gold Disk's *Advantage* program because it's fast and easy to use – but you'll have to wait until next month for the full details of how I used it, and what problems I had.

Until then, the table on the left is an example of the sort of report you can expect to see. This was produced by the *Superbase* DML program shown in Listing 1. Percentage figures shown in brackets demonstrate that the majority of male club members answering the survey, over a third, are over 45 years of age. Just by changing a single character in the listing we can get results for the women too.

THE END?

Not yet. By asking the right questions it is easy to prove, for example, how many men aged between 35 and 54 wear a digital watch, drink lager from a can and like to listen to Brahms with their legs crossed... (For more information – and ironically humorous tales – consult *How to Lie with Statistics* by Darrell Huff, ISBN 0 14 02 1300 7.) In practice, given the right set of data you can keep on analysing until the cows come home.

Next month I'll be looking at reporting in much more detail. As a taster of what's coming: the data set produced by analysis of this survey produced over 60 graphs – mostly pie and bar charts; enough to fill *Amiga Shopper* and far too many for the average manager to take in. Next month I'll be showing how to eliminate the anomalies and interpret the data; although even then you can only be 95 per cent sure of the results... AS

I am indebted to the members, staff and committee of the Club used in this survey for without whose help and assistance this test would never have been possible.

SHOPPING LIST

Superbase Professional......£411.20

Supplied by Precision Software
6 Park Terrace
Worcester Park
Surrey KT4 7JZ
☎ 081-330 7166

Cliff's Code Conundrum

Technical editor Cliff Ramshaw presents the answer to the Code Conundrum set in issue 3

Here it is at last, folks: the winning answer to the first Code Conundrum. As you may remember, the task was to write a program to plot the motion of the Earth, Moon and Sun.

Many thanks for all of your entries. The standard was excellent.

The winner was R Broughton of Farnborough in Hampshire, who will be receiving £50.

One of the problems which he overcame was the fact that the Earth-Moon orbit is 400 times smaller than the Earth-Sun orbit, creating a difficulty in drawing everything on the Amiga's screen. He got around this by individually scaling the two halves of the system. A further difficulty was introduced by the PD Sozobon C compiler, which is unable to handle numbers over 1×10^{19} in size.Because of this, he decided to scale all physical values in terms of the Moon.

His program is written in C, and is unfortunately too long to print in its entirety here. We will be putting it in the 'amigashopper' conference on CIX, but in the meantime, I'll print some of the more salient excerpts and explain what is going on.

The program begins by defining several constants, mostly of use in the plotting stage – especially complicated because of the difference in scale between the Earth-Moon and Earth-Sun systems.

Then, a structure called 'Body' is declared. This is used to hold the position, velocity and acceleration of each mass, in terms of *x* and *y* components. After that, the data is initialised for a custom screen, a window and some sprites. Then comes the 'main' section of the code, which works by calling a succession of functions, the most important of which is motions().

Motions() initialises the positions and velocities of the three planets. It then goes on to check for the mouse button being pressed (in which case the program finishes) then plots the planets, calculates their new accelerations, velocities and positions, and loops around to do it all again. All of this is done by calling a series of functions.

LISTING 1 • LISTING 1

```
accelerations()
{
/* variable declarations for use by ↲
this function */
/*sun-earth dist (squared)*/
d2se=(earthinfo.x*earthinfo.x)+(earth ↲
info.y*earthinfo.y);
/*sun-moon dist (squared)*/
d2ms=(mooninfo.x*mooninfo.x)+(mooninfo ↲
.y*mooninfo.y);
dxem=earthinfo.x-mooninfo.x;
dyem=earthinfo.y-mooninfo.y;
/*moon-earth dist (squared)*/
d2em=(dxem*dxem)+(dyem*dyem);
/* force exerted along line joining ↲
centres of bodies */
/* sun - earth */
fse=GRAVITY*EARTHMASS*SUNMASS/d2se;
/* sun - moon  */
fms=GRAVITY*MOONMASS*SUNMASS/d2ms;
/* earth - moon */
fem=GRAVITY*MOONMASS*EARTHMASS/d2em;
/* sun - earth distance */
dse = sqrt(d2se);
/* sun - moon distance */
dem = sqrt(d2em);
/* earth - moon distance */
dms = sqrt(d2ms);
/*find components of forces*/
/* force between earth & sun +ve for ↲
sun -ve for earth */
/* relative to sun */
fsex=fse*(earthinfo.x-suninfo.x)/dse;
fsey=fse*(earthinfo.y-suninfo.y)/dse;
/*force between earth&moon*/
femx=fem*(mooninfo.x-earthinfo.x)/dem;
femy=fem*(mooninfo.y-earthinfo.y)/dem;
/*force between moon & sun*/
fmsx=fms*(suninfo.x mooninfo.x)/dms;
fmsy=fms*(suninfo.y-mooninfo.y)/dms;
/*add forces and calculate
accelerations*/
suninfo.ax=(fsex-fmsx)/SUNMASS;
suninfo.ay=(fsey-fmsy)/SUNMASS;
earthinfo.ax=(femx-fsex)/EARTHMASS;
earthinfo.ay=(femy-fsey)/EARTHMASS;
mooninfo.ax=(fmsx-femx)/MOONMASS;
mooninfo.ay=(fmsy-femy)/MOONMASS;
}
```

The initmotions() function sets up the initial positions and velocities of the three planets. The Sun is defined to be at the origin of the system, which starts with all three bodies in a horizontal line, so that the Earth and Moon *y* coordinates are both zero. The Earth's *x* coordinate is simply its distance from the Sun; the Moon's is the sum of its distance from the Earth and the Earth's distance from the Sun.

The initial velocities are calculated from the formula

$$V^2 = G(M_1 + M_2)/r$$

which gives the relative velocites of two masses, M_1 and M_2. The Earth and Moon are treated as one unit, and V is calculated for this collective mass relative to the Sun. The distance used is from the Sun to the centre of gravity of the Earth/Moon system.

Having found this, the function goes on to find the relative velocity between the Earth and Moon using the same formula. This is added to and subtracted from the velocity already found, giving the Earth's and Moon's velocities respectively.

```
initmotions()
{
float xc,vc,vem;
suninfo.x    = 0;
suninfo.y    = 0;
suninfo.vx   = 0;
suninfo.vy   = 0;
suninfo.ax   = 0;
suninfo.ay   = 0;
/* centre of gravity of
earth-moon system */
xc = (EARTHMASS*EARTHORBIT +↲
MOONMASS*(EARTHORBIT+MOONORB↲
IT))/(EARTHMASS+MOONMASS);
/* velocity of centre of
gravity around sun */
vc = sqrt(GRAVITY*(MOONMASS↲
+EARTHMASS+SUNMASS)/xc);
/* relative speeds of moon
and earth */
vem=sqrt(GRAVITY*(EARTHMASS+↲
MOONMASS) / MOONORBIT);
/* earth start conditions */
earthinfo.x = EARTHORBIT;
earthinfo.y = 0;
earthinfo.vx = 0;
earthinfo.vy = vc+MOONMASS ↲
*vem/(EARTHMASS+MOONMASS);
earthinfo.ax = 0;
earthinfo.ay = 0;
/* moon start conditions */
mooninfo.x = EARTHORBIT
+MOONORBIT;
mooninfo.y = 0;
mooninfo.vx = 0;
mooninfo.vy = vc-EARTHMASS* ↲
vem/(EARTHMASS+MOONMASS);
mooninfo.ay = 0;
mooninfo.ay = 0;
}
```

The section to work out the forces on the bodies and translate these into accelerations is shown in listing 1.

Each of the bodies' velocities is altered by the velocity() function, using the equation

$$v=u+a*dt$$

where dt is a time step small enough to make the motions accurate. The velocities are shifted relative to the Sun's velocity, so the Sun remains at the centre of the screen:

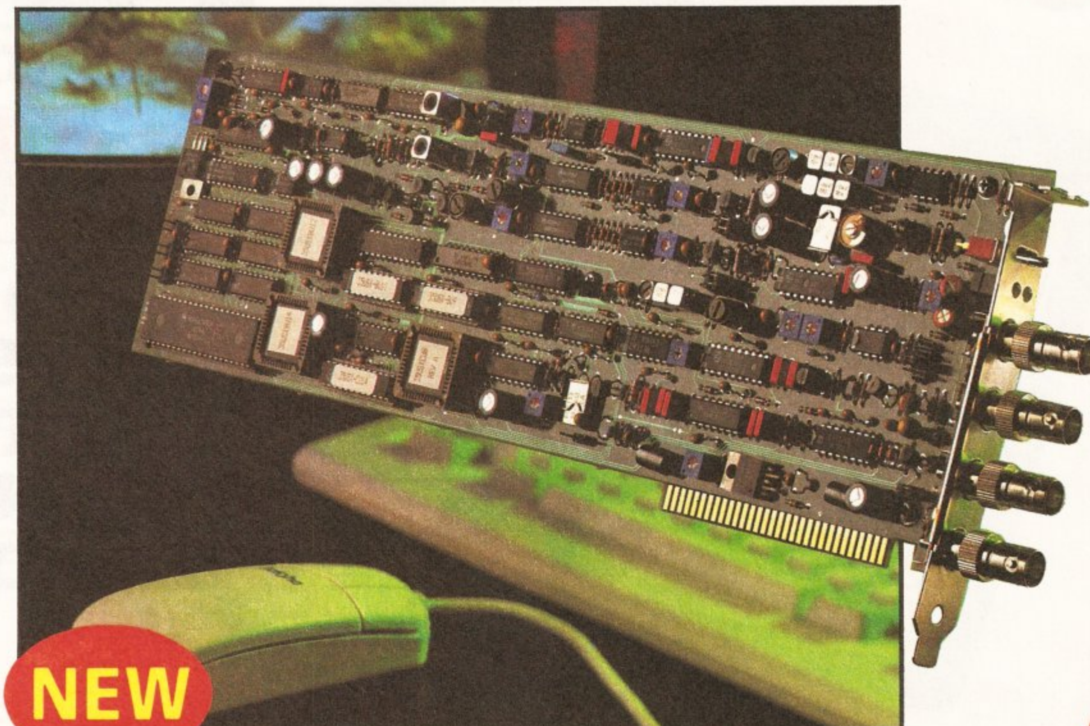
```
velocities()
{
suninfo.vx=suninfo.vx+dt*   ↲
suninfo.ax;
suninfo.vy=suninfo.vy+dt*   ↲
suninfo.ay;
earthinfo.vx=earthinfo.vx+dt↲
*earthinfo.ax;
earthinfo.vy=earthinfo.vy+dt↲
*earthinfo.ay;
mooninfo.vx=mooninfo.vx+dt* ↲
mooninfo.ax;
mooninfo.vy=mooninfo.vy+dt* ↲
mooninfo.ay;
/* normalise velocities */
earthinfo.vx=earthinfo.vx-  ↲
suninfo.vx;
earthinfo.vy=earthinfo.vy-  ↲
suninfo.vy;
mooninfo.vx=mooninfo.vx-    ↲
suninfo.vx;
mooninfo.vy=mooninfo.vy-    ↲
suninfo.vy;
suninfo.vx=0;
suninfo.vy=0;
}
```

Finally, the planets' positions are updated according to their velocities:

```
positions()
{
earthinfo.x=earthinfo.x+dt*↲
earthinfo.vx;
earthinfo.y=earthinfo.y+dt*↲
earthinfo.vy;
mooninfo.x=mooninfo.x+dt*↲
mooninfo.vx;
mooninfo.y=mooninfo.y+dt*↲
mooninfo.vy;
}
```

Those of you wondering where this month's conundrum is had better divert your attention to the fractal supplement. That's all for now! AS

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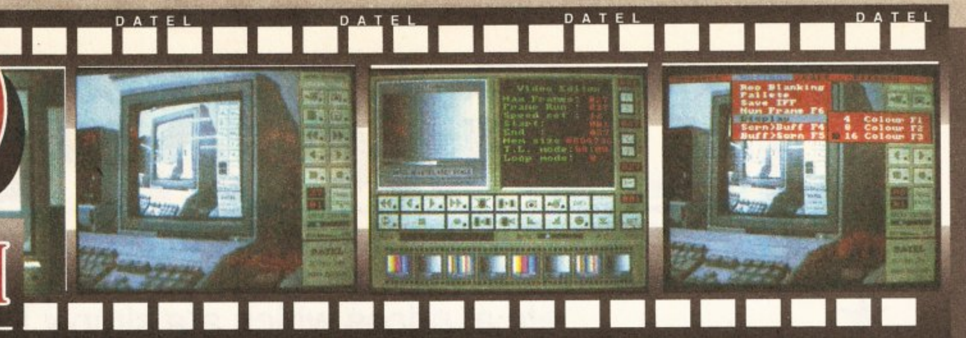
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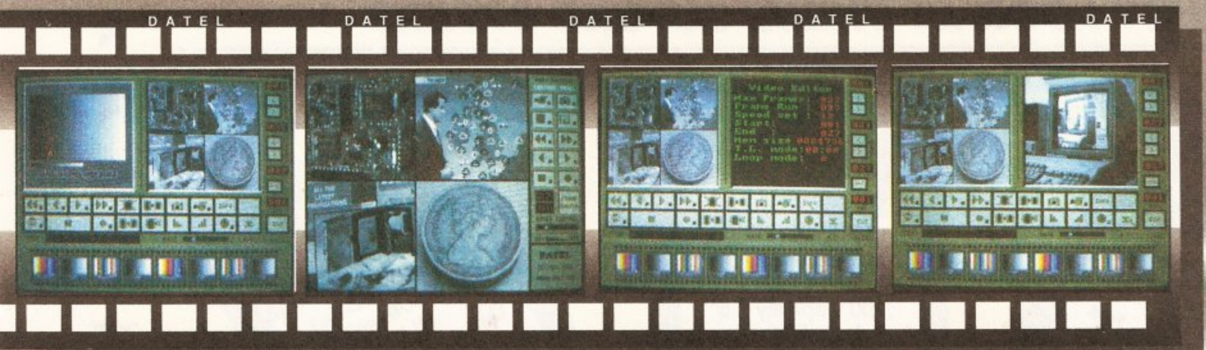
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A/F VIDIGI

AMOS action

This month Phil South looks at the AMOS Animation Language, creating and moving screens and much, much more...

Welcome to the wild world of AMOS. I've been merrily compiling everything in sight since I got the compiler last month, and very few programs have tripped up – which is a testament to the bug testing at Europress Software and the skill of Francois Lionet. I haven't yet had a chance to talk to Fráncois, and I guess this will have to go on the back burner for a bit until he's free again. But *AMOS 3D* is out as we speak, and I'll be covering that for sure next time.

This month I want to talk to you about screens, and how to flip them around in AMOS.

NURSE, THE SCREENS!

AMOS has some very powerful commands for the manipulation of screens and their contents. We all know about the 'Screen Open'

continued on page 96



"Welcome to the AMOS column, the place where every month you can find tutorials and lots of hints and tips for use with Europress' AMOS Basic interpreter, along with its ancilliary programs."

Phil South

AMOS HINTS AND TIPS

Every month I will be printing hints and tips on AMOS from my own sources and from you, the readers. If you have any hints and tips (preferably accompanied by mini listings) you want to send me, whack them on paper or – even better – on a disk and send them to: Phil South, AMOS Column, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW. Or you can e-mail me on CIX (snouty@cix.compulink.co.uk), Micronet (219997854), Telecom Gold (74:MIK2077) or The Direct Connection (uad1135@dircon.uucp).

- Many of you responded to my question about quadratic equations, but the best entry was from Richard Padley. Richard says in his letter that he doesn't even have an Amiga, but reads *Amiga Shopper* because he likes it! Blimey! I had to change some of the lines from the letter to make it more AMOS-friendly, but that was just a matter of format. Even though he's not an AMOSser he certainly knows his onions mathematically speaking, as this rather elegant program testfies:

```
' QUAD by Richard Padley
'
Screen Open 0,640,256,2,Hires
'
MAIN:
Print "This prog solves the quadratic equation"
Print : Print "       ax^2+bx+c=0"
Print : Print "Please enter the coefficients a,b and c."
Print: Input "a:";A#
Input "b:";B#
Input "c:";C#
Print
R#=B#^2-4*A#*C#
If R#>=0 Then Goto REAL Else Goto IMAGINARY
'
REAL:
X1#=(-B#+R#^0.5)/(2*A#)
X2#=(-B#-R#^0.5)/(2*A#)
If R#=0 Then Print "The solution is real where x=";X1# Else Print "The solutions are real where x=";X1#;"and x=";X2#
Goto ND
'
IMAGINARY:
R#=Abs(R#)
REALPART#=-B#/(2*A#)
IMAG1#=R#^0.5/(2*A#)
IMAG2#=-(R#^0.5)/(2*A#)
Print "The solutions are complex where x=";REALPART#;"+";Abs(IMAG1#);"i and x=";REALPART#;" -";Abs(IMAG2#);"i"
'
ND:
Print "Again? (Y/N)"
X$=Input$(1)
If Upper$(X$)="Y" Then Cls : Goto MAIN
```

I like the brevity and clarity of that program, and the fact that it worked first time is neat because I typed it into AMOS from Richard's letter, and not from a listing! Many thanks to all of you who gave it a crack.

- And now a jazzy 3D requester from Chris Hurst, which really is something very special and brings all manner of very neat Workbench 2 and 3D-type projects to mind. Very well done, Chris, let's have some more of the same. How about a 3D menu?

```
Rem A sort of 3D Requester!
Rem (c) Chris Hurst 1991
Rem
Default
Paper 0 : Pen 2 : Cls : Curs Off
REQ["THE NEW 3D REQUESTER BY CHRIS","HURST! HOPE YOU LIKE IT","CARRY ON",""]
Print "Program Loop. Press Q to Quit"
Z=0
MAINLOOP
'
Procedure MAINLOOP
Shared Z
Do
K$=Upper$(Inkey$)
If K$="Q" Then REQ["user selected quit option","please confirm","Okay!","Cancel"]
If Mouse Key=2 Then REQ["User selected mouse option","please confirm","Okay","Cancel"]
If Z=1 Then REQ["Quit confirmed","Bye","Bye",""] : End
If Z=2 Then Z=0
Loop
End Proc
'
Procedure REQ[T1$,T2$,B1$,B2$]
Shared Z
Screen Open 7,640,60,4,Hires
Screen Display 7,130,110,,
Limit Mouse 215,110 To 350,155
Show
Flash Off
Paper 0 : Cls : Curs Off
Palette $0,$444,$777,$FFF
Reserve Zone 2
If Len(T1$)>33 Then T1$=Left$(T1$,33)
If Len(T2$)>33 Then T2$=Left$(T2$,33)
If Len(B1$)>8 Then B1$=Left$(B1$,8)
If Len(B2$)>8 Then B2$=Left$(B2$,8)
Ink 1 : Bar 170,0 To 470,52
Ink 3 : Bar 171,1 To 470,59
Ink 2 : Bar 171,1 To 468,58
Ink 0 : Box 180,10 To 458,30
Ink 3 : Draw 180,30 To 458,30
Ink 3 : Draw 458,30 To 458,10
If Len(B1$)>0
Ink 3 : Box 200,37 To 270,52
Ink 0 : Draw 200,52 To 270,52
Ink 0 : Draw 270,52 To 270,37
End If
If Len(B2$)>0
Ink 3 : Box 360,37 To 430,52
Ink 0 : Draw 360,52 To 430,52
Ink 0 : Draw 430,52 To 430,37
End If
Ink 0,2
Text 184,19,T1$
Text 184,27,T2$
Text 204,47,B1$
Text 364,47,B2$
If Len(B1$)>0 Then Set Zone 1,200,37 To 270,52
If Len(B2$)>0 Then Set Zone 2,360,37 To 430,52
Do
Z=Mouse Zone
If Z=1 and Mouse Key=1 Then Ink 0 : Box 200,37 To 270,52 : Ink 3 : Draw 200,52 To 270,52 : Ink 3 : Draw 270,52 To 270,37 : Bell 70 : Wait 10 : Screen Close 7 : Limit Mouse : Pop Proc
If Z=2 and Mouse Key=1 Then Ink 0 : Box 360,37 To 430,52 : Ink 3 : Draw 360,52 To 430,52 : Ink 3 : Draw 430,52 To 430,37 : Bell 40 : Wait 10 : Screen Close 7 : Limit Mouse : Pop Proc
Loop
End Proc
```

continued from page 95

command, as I use it regularly in programs I print here. But what about moving screens around once you have them defined and loaded?

'Screen Hide' will take a screen you've loaded and send it away somewhere until it is needed. To show it again, you just need to use the 'Screen Show' command. As always in AMOS, Show/Hide are the exact opposite.

'Screen Copy' is used as a part of the process of scrolling all or part of screens, in combination with 'Def Scroll', 'Scroll' and 'Screen Swap', as we see in this example (which, sadly, will only work on machines with 1Mb or more of RAM):

```
Load Iff "name your path                ↵
and picture here",1
Screen Open 0,320,256,32,Lowres
Get Palette 1 : Curs Off :              ↵
Flash Off
Screen Copy 1 To 0 : Screen 0
Double Buffer : Bob Update Off
S=2
Rem Define scrolls
Def Scroll 1,80,80 To 240,              ↵
240,0,-S : Rem scroll screen
Repeat
For Y=0 To 199 Step S
Scroll 1
Screen Copy 1,80,Y,240,Y+S              ↵
To 0,80,240-S
Screen Swap
Screen Copy 1,80,Y,240,Y+S              ↵
To 0,80,240-S
Wait Vbl
Next Y
Screen Swap : Wait Vbl : Scroll 1
Until Mouse Key
```

The screen you choose is loaded, and an area defined by the 'Def Scroll' statement is scrolled upwards using the Repeat...Until loop. This is done smoothly and continuously until the mouse button is pressed, at which time the program ends. Screen swap has an invisible screen (called the 'logical screen') on which it renders things – like scrolls, for example. When the object or screen has been modified, the results are copied to the real screen. Logical screens are very useful for smoothing otherwise slow or clunky rendering routines. Try the example above and alter the settings to see how it changes when you tweak certain parts of the program, particularly the 'Def Scroll' and 'Screen Copy' lines.

DEMO CORNER

One of the best and most interesting demos I've seen this month is *Niall 2*, from APDL disk 164. *Niall* is an artificial intelligence program, a sort of second generation of the old *Eliza* program. Like a parser in an adventure game, the program makes an attempt to make some sense out of random conversational input. As you use the program, its vocabulary gets bigger. Then you start to get the spooky feeling that there is someone in there talking back at you, learning and sometimes even poking fun at you. Most of this is chance, but the effect is very entertaining.

And that's all we have time for this month. Next issue I'll be doing part two of the AMAL tutorial, and looking in depth at using *AMOS 3D* . See you then! AS

SHOPPING LIST

AMOS can be obtained from your local stockist or from:

Europress Software
Europa House, Adlington Park,
Macclesfield, SK10 4NP
☎ 0625 859333

All AMOS PD software can be obtained from:

AMOS PD Library
25 Park Road,
Wigan WN6 7AA.
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INTRODUCTION TO AMAL: PART 1

I've been saying that I was going to get around to AMAL for a few issues now, and finally the time is upon us. AMAL is the AMOS Animation Language, and is a powerful way of animating things you move around the screen without taxing the processor too much. AMAL commands are specially optimised Basic program commands which are compliled before running, which makes them super fast. You can incorporate AMAL programs within your regular AMOS code, and this is how you do it.

The first thing to know is that AMAL code can be written in one of two ways:

1 As string statements in a normal AMOS program, or

2 Using the AMAL Editor program. It is possible to write a whole program using just AMAL and letting AMOS run the boring stuff. The trade-off is that AMAL is harder to learn and implement well if you're a beginner to programming.

From AMOS

If you're using AMAL from within AMOS, then you must embed the commands in strings in an AMOS statment like so:

```
Amal 1,"S: M 300,200,100 ; M -300,-200,↵
100 J S"
```

and then run the AMAL program by typing:

```
Amal On 1
```

which runs AMAL program number 1. Each of the AMAL commands consists of one or two letters, like M for Move or PL for Play. If you type the lower case letters for the rest of the word, they will be ignored by AMAL, but will be easier to read.

AMAL contains very clever commands like the Play (or PL) command, which is used for recording a set of mouse moves, for an attack wave for example, and playing them back to a sprite. There are also commands for reading the joystick and mouse positions. These are much faster than the normal AMOS commands, and are very useful for fast, hard action-type games, or even for something like a graphics program where fast mouse reading and movement is desirable if not essential.

If the AMAL program is a single line then putting:

```
Amal 8,"program"
```

is OK. But if your program uses more lines you have to add each line to a variable, and then call the variable an AMAL program at the end. This is the way it is done in most AMAL programs – in this case I'm using C$, but of course any string variable can be used:

```
C$="For R=0 To 10 ;"
C$=C$ + "For R0=1 To 320;Let X=X+1;    ↵
Next R0;"
C$=C$ + "Let Y=Y+8 ;"
...
```

and so on, with each program line adding the current line to the last, by concatenating it with C$. At the end of the addition statements, you make the C$ string equal to the AMAL program by adding the 'Amal n' command, and running the program with Amal On as the last line, like so:

```
Amal 8,C$ : Amal On 8
```

Saying Amal 8,C$ is like saying Amal 8,"your program", and the Amal On 8 line immediately after runs the program you've just created.

AMAL Commands

The range of commands in AMAL is much smaller than in AMOS itself, but although the instruction set is very restricted it can do a great deal, especially in the creation of games. The command set falls into two categories, the commands and the functions. There are basically just 13 commands; these are:

```
Move (or M)
Anim (or A)
Let (or L)
Jump (or J)
If (or I)
For To Next (or F T N)
Play (or PL)
Pause (or P)
Autotest (or AU)
Exit (or X)
Wait (or W)
On (or O)
Direct (or D)
```

There are also 15 so-called functions. These are simple ways of getting information to and from the screen, joystick and mouse. However, there are a couple of the functions which don't fall in to this category; these are the VU meter and the random number function. Everyone needs random numbers, and you can get these by employing the:

```
=Z(n)
```

function, where n equals the number range. For example, using 255 for n will return a value between 0-255. The VU meter function is handy for that interesting VU meter in your latest demo, where the sprites or graphics bob up and down or left to right in time to the music. Check the function of both this and the 'VuMeter' AMOS command in the manual.

Using AMAL Editor

If you intend to print out your program in a magazine or to distribute to friends, then putting your AMAL code into the AMOS listings is a better way to go. But if you are the only person who is going to see the code – if you're going to compile your program, for example – then the AMAL Editor is better. The AMAL Editor takes your AMAL programs and puts them into a memory bank. Then you can call the AMAL programs from a bank, saving space in your AMOS program and saving anyone inspecting your code. I'll be looking at the AMAL Editor in depth next month.



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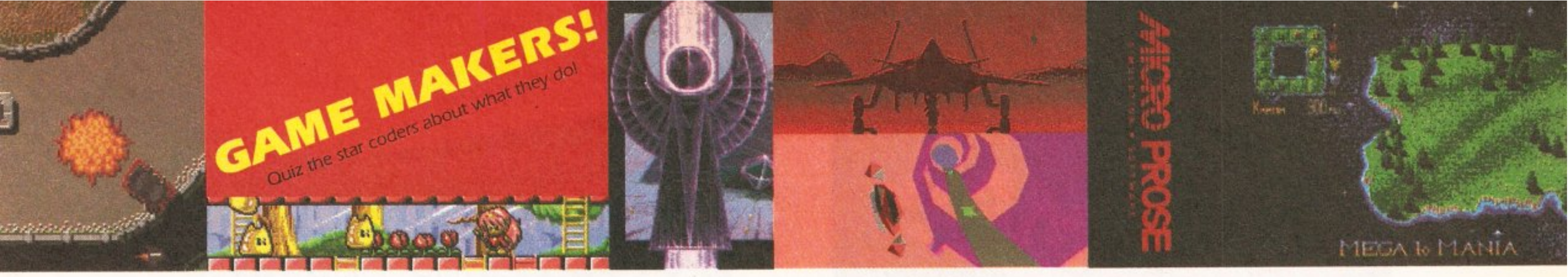
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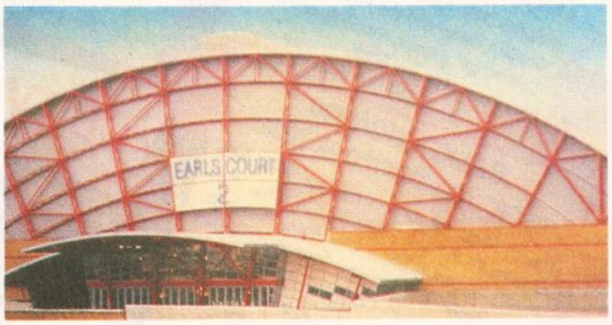
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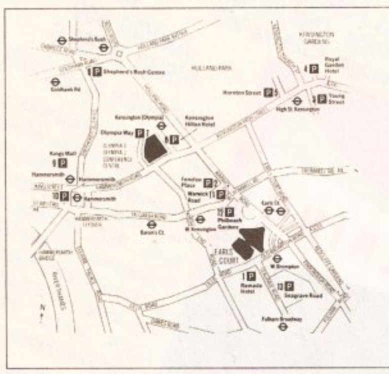


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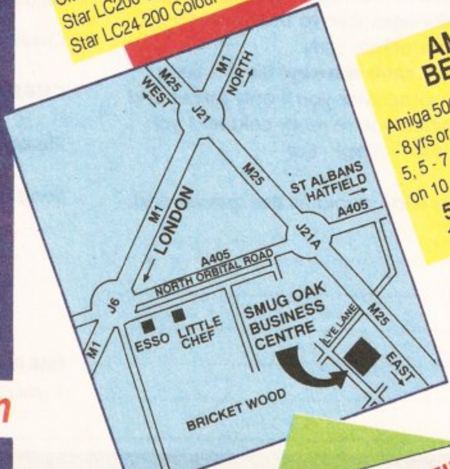
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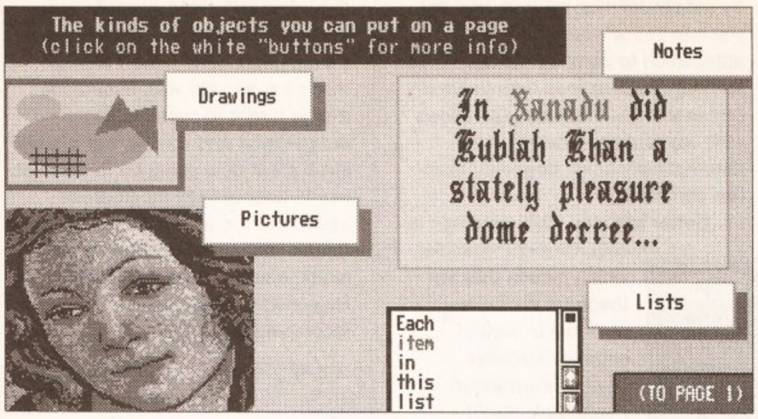
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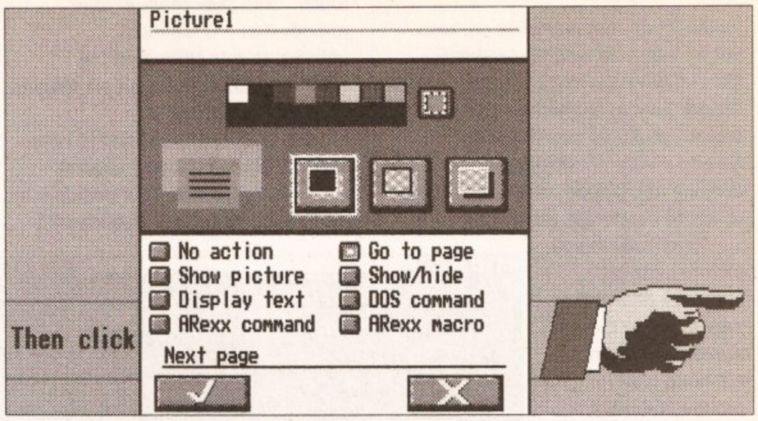
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WHERE TO FIND US



Hyperbook supports four types of object, all of which can be assigned to carry out particular tasks when clicked upon.



And button can be set to perform one of eight different tasks when the user clicks on it – the tasks are defined by a requester, as shown above.

Multimedia marvel

Gold Disk's latest release, Hyperbook, means that anyone can get in on the multimedia malarky. Jason Holborn takes the program for a test drive

> "As an Amiga fan, I'm always keen to look at exciting new products – and that's exactly what *Hyperbook* is."
>
> Jason Holborn

Unless you've been on holiday in darkest Siberia for the last two years or so, you can't have helped but notice that 'multimedia' has become the latest buzzword on the lips of every computer user worth their salt. The fact is, multimedia is big business. In little more than two years, the industry has gone multimedia mad, with such industry hard-hitters as Apple and IBM jumping on the bandwagon in an attempt to corner the market.

Commodore too would like a slice of the action. The Amiga is a natural for multimedia work, but up until recently there just wasn't the software available to exploit the Amiga's obvious talents. A few months ago, Commodore announced the launch of *AmigaVision*, a powerful multimedia authoring environment which is bundled free of charge with all Amiga 3000s sold.

True multimedia may not be of much use to most of us, but the theory behind it most certainly is – at least, that's what Gold Disk would have us believe if its latest release is anything to go by. Badged as 'a free-form personal information manager for the rest of us', *Hyperbook* borrows more than a few tricks from more powerful programs.

DAINTY DATABASE

Like most multimedia applications, *Hyperbook* is really nothing more than a glorified database. But, unlike a database, you're given far more control over how the information is presented to the user. Programs like *Superbase* allow you to design 'forms', but *Hyperbook* takes this concept much further, allowing the forms themselves to become an integral part of the application.

Hyperbook uses the now famous system of linked cards that was pioneered by Apple with its *HyperCard* system. Not wanting to infringe anyone's copyright, Gold Disk calls its decks 'books', with each card within the deck being referred to as a 'page'. In some ways, this seems a better way of describing the principles behind the *HyperCard* approach; if you think of a *HyperCard* deck as a series of linked pages within a book, then you're already halfway there.

Each page within your book can contain any combination of four basic elements – buttons, notes, drawings and lists. Each can be assigned one of a choice of eight actions that will be performed when the particular element is clicked upon with the left mouse button. These actions range from displaying an IFF image, displaying a text file or moving between pages, to running both DOS commands and ARexx scripts.

The four basic elements on offer are highly configurable. In the case of a note (which is basically a gadget containing text), you have control over the font used, the colour, the line spacing and tracking of the font, the text style and so forth. The gadgets can be altered considerably too, allowing you to customise your applications with ease.

To make your *Hyperbook* application at all usable, you must remember to link each page, making it accessible once the application is complete. The simplest way to do this is to create movement gadgets on each page of your book – but even then it's all too easy to lose track of the odd page or two once your application starts to grow.

PICTURE THIS!

Obviously no multimedia program would be complete unless it gave you some form of control over different

continued on page 102

BEGINNERS START HERE

Multimedia is a very powerful system for handling information. A multimedia application can draw upon information stored in just about every conceivable format, ranging from static images and text generated by the Amiga itself to full motion video footage stored on a video disk player and high-quality audio stored on a standard compact disc.

What makes multimedia so special is the fact that it is interactive – that is, you (the user) are given full control over what information is displayed, and when. By using devices such as touch-sensitive screens, the user need never touch a keyboard or mouse – instead, the whole application can be controlled by literally pointing with your finger at on-screen 'hot spots'.

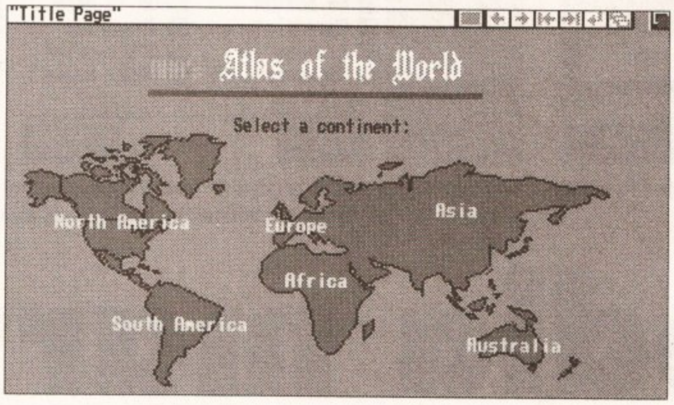
In practice, multimedia is nothing new. If you've ever visited the local arcade, then the chances are that you've already seen multimedia in action. In particular, Atari's *Mad Dog McKree* pushes multimedia hardware to its limits. The game – which is set in the wild west – sees players pitted against video footage of real life actors dressed in cowboy attire. As the on-screen cowboy goes for his gun, you have to draw your (tacky plastic) gun from its holster before he can pump you full of lead.

Multimedia also has more serious applications though. You'll find the Amiga being used for interactive business presentations, education, training, simulations, point of sales and much more besides.

continued from page 101

media types. *Hyperbook* is perhaps not as well endowed as programs like *AmigaVision* in this respect – it cannot handle animation, sound or speech at all, so don't expect to be able to create an all-singing, all-dancing application without having to resort to desperate measures.

Thankfully though, pictures can be imported into your pages, giving them an attractive look that will keep your prospective user interested. When you first load a picture, *Hyperbook* allows you to clip out (crop) a section of the image. If the dimensions of the image are greater than (or different to) the current page settings, then you can scale the image to your heart's content.



Unfortunately, the current release of *Hyperbook* only supports two screen modes for its pages, which really is a drag. Those modes are high and medium resolution, with a maximum of 16 colours in either. Images in other formats can be imported, in which case *Hyperbook* attempts to remap the palette of the image to the best of its abilities. Unfortunately, this isn't saying much – you're usually left to do most of the actual palette tweaking yourself.

You can, of course, display HAM images and so on, but you can do nothing with them – in fact, it's definitely a case of look but don't touch. Gold Disk really should remedy this – it's almost unbelievable to think that the company should let such an obvious problem slip through.

I'm also very surprised to note that *Hyperbook* doesn't support animation or sound. It is possible to get around this using *Hyperbook*'s 'DOS' command, which allows you to run an external program from within *Hyperbook*. Simply by installing one of the many PD animation or sound players (Sparta's *ShowAnim*, for example) in the C: directory of your system, you can extend *Hyperbook*'s media handling capabilities substantially.

Whether you're creating information systems for education, business or just for fun, *Hyperbook* is well worth checking out.

COMMAND PERFORMANCE

The true power of *Hyperbook* doesn't become apparent until you start to explore its powerful macro language, HML (Hyperbook Macro Language). By simply defining macros (scripts), you can set up your multimedia application to carry out a vast number of operations both internally and externally. The language allows your application to modify itself automatically using powerful Basic-like commands.

Better still, the HML language is fully ARexx-compatible, which means that (in theory) it should be possible to control external hardware devices from within *Hyperbook*. You'll obviously need an ARexx-compatible driver for the device, but now that ARexx has been adopted as a standard, this shouldn't prove to be too much of a problem. ARexx will also allow your *Hyperbook* applications to talk to other programs running on the Amiga, sharing data and even controlling the operations of those programs.

Unfortunately, there is a problem – HML won't work unless you've got ARexx installed on your system. Even the internal operations that control *Hyperbook* itself refuse to work at all. The problem is, though, that virtually no-one actually has ARexx yet, due mainly to the fact that Commodore still hasn't released Workbench 2.0 for anyone but those lucky A3000 owners. You can buy ARexx separately, but there seems little point if you'll be able to get it free of charge with OS 2.0.

CONCLUSION

Hyperbook most certainly doesn't pose any threat to dedicated multimedia authoring systems like Commodore's own *AmigaVision*, but the potential is definitely there. It's one of the most intuitive multimedia systems I've ever had the pleasure to use. After little more than ten minutes reading the manual, I was able to use the vast majority of *Hyperbook*'s features – something that I most certainly can't say about *AmigaVision* or *CanDo*!

I'd very much like to see Gold Disk take *Hyperbook* a stage further, bringing it into the realms of truly professional multimedia authoring. Direct support for the more common video disk controllers would be a start, along with more control over the 'books' themselves (a more powerful scripting language is definitely needed, along with more tools to manipulate data). Let's just hope that someone at Gold Disk is reading this – who knows, perhaps we'll see *Hyperbook Professional* in the reasonably near future!

Gripes aside, I must admit that I like *Hyperbook*. In fact, I like it a lot. I've used just about every Amiga multimedia authoring system under the sun, but never have I had so much fun as I did with *Hyperbook*. It's no threat to systems like *AmigaVision* and *CanDo*, but it's still got a great deal going for it. Ease of use is undoubtedly its greatest asset, but it's also powerful enough for the vast majority of personal multimedia applications. All in all, *Hyperbook* comes highly recommended. **AS**

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CHECKOUT HYPERBOOK

Ease of Use ●●●●○
Quick and easy – that's the best way of describing *Hyperbook*. The user interface is well designed and logical, allowing you to cruise through its requesters at speed.

Features ●●●○○
It's not quite up to the same standards as programs like *CanDo* and *AmigaVision*, but *Hyperbook* achieves what it sets out to do. Picture handling is rather limited, but everything else is well implemented.

Documentation ●●●○○
Complete with three tutorials and comprehensive appendices, *Hyperbook*'s manual is well written and informative. Also included is an extra 'Applications Guide' which lists 35 application suggestions for this powerful program.

Price Value ●●●●○
At £99, *Hyperbook* is just a few pence under the magic ton. This is rather a lot for a program that can't directly handle external media devices – although I must say that it performs well in other areas.

Overall rating ●●●●○

Hyperbook is a good, reliable personal multimedia authoring system at a fairly reasonable price. If you're looking for an introduction to the whole area of multimedia, this could be the one for you.

JARGON BUSTING

ARexx – Developed by William S Hawes, ARexx is the Amiga port of the powerful Rexx intertask communications standard found on many mainframe computers. It allows applications to 'talk' to each other within a multitasking environment, allowing them to share data and even control each others' operations. With the release of Workbench 2.0, ARexx has now become part of the Amiga's operating system.

Hypermedia – Often confused with multimedia (*qv*), hypermedia is actually a system of cross-referencing information using sophisticated links. Multimedia is built upon the theory of hypermedia, making the two virtually inseparable.

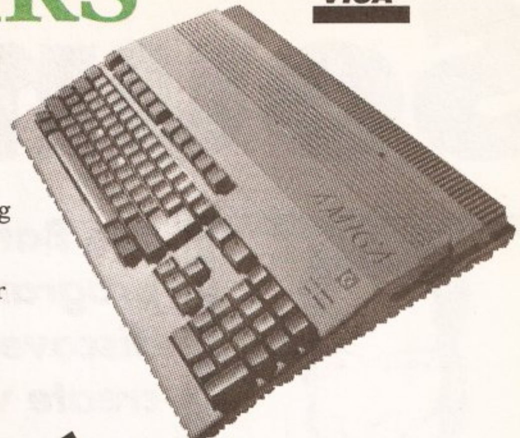
Hypertext – This is the most powerful tool in the hypermedia toolbox. It allows individual words within a passage of text to be linked to other items of relevant information. By simply clicking on one of many 'keywords', information relevant to that word is automatically displayed. In this way, the user can travel through vast amounts of information, displaying only the data required.

Multimedia – Multimedia applications are basically glorified databases, which can contain information in just about every format you can think of. However, what makes multimedia so special is the fact that it is interactive – that is, the user has complete control over what information is displayed and when.

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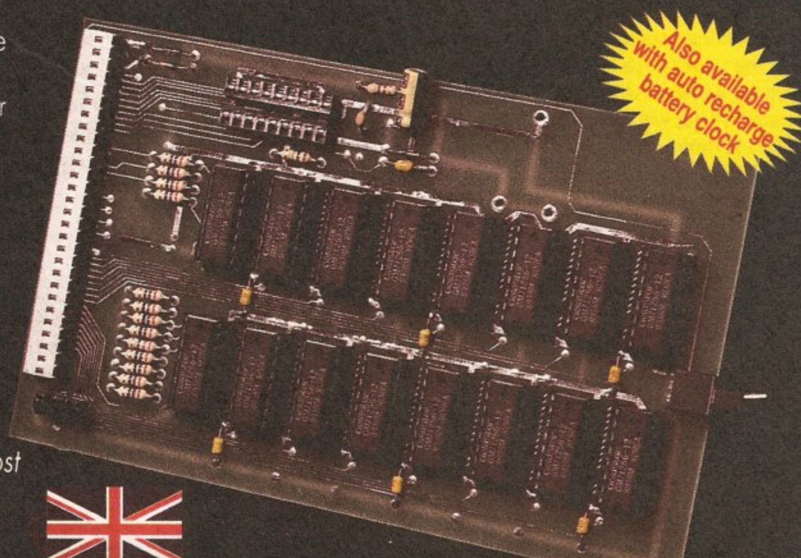
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Sound sense

Jon Bates compares three voicing programs for the Amiga, and discovers what is necessary to create weird and wacky sounds



"The best way to edit a synth's sounds is by using a program on a computer. The multi-tasking Amiga is the ideal tool for this – but is the software up to the task?"

Jon Bates

One of the drawbacks of modern synths and tone modules is that they are extremely difficult to program using the on-board controls. Since the advent of the commercial digital synthesizer about 8 years ago, this difficulty has been reflected in the ever-growing number of companies marketing 'off-the-peg' sounds that you put into your particular synth, usually from a cartridge or smart card. These do not come cheap – normally somewhere between £25 and £100 a time. You are also faced with either throwing away some of the sounds you have or forking out for more storage media – a RAM cartridge or card. Although there are synths that have floppy disk drives for storing sounds, these tend to be in the upper price bracket.

Good voicing software will not only create sounds but will also store them to disk in libraries. You can often stack them up in banks to be loaded into the instrument and certainly re-configure to a new library of sounds from those you already have. I find that I tend to have three main general sound banks for each synth that reflect different broad music styles that I might work in. If I need to bring in specialist sounds, however, it is quite easy to call them in from the disk library and re-organise the whole bank of sounds.

The programs under consideration this month come from the American software house Dr T's and the UK's own Gajits, and between them they cover a wide range of synths and tone models, both past and present. Dr T's has recently launched a program for the Amiga which will adapt itself to virtually any synth or effects unit; at present it can cope with over 90. *X-Or* is the first universal editor for the Amiga, and has some extremely powerful features. It will be compared alongside other software packages, but you should remember that *X-Or* must first be configured to your system and equipment. This sort of program can be thought of as an application into which you load specific parameters for your synth. The good thing is that you can have as many synths as you want co-existing. All you do is call up the appropriate page to edit them.

For the main test I have chosen to use the Roland MT-32, since is both a popular home tone module and a pain in the neck. It is difficult and complex to program, and any sound you create is lost the minute you turn it off – an ideal candidate for voicing software. The other programs on review are Gajits' *CMpanion* and the MT-32 Editor from Dr T's *Caged Artist* series of voicing software.

STARTING OFF

Because of its multiple applications, *X-Or* requires that you initially set up the MIDI channels and instrument numbers from a separate window. The MT-32 is odd in that it in requires you to set a systems exclusive unit number of 17, which may well bamboozle the beginner. However, once correctly set up it behaves perfectly. There is also a help page which is very useful if, like me, you fail at first to get the MT-32 talking to the Amiga. In *Caged Artist* and *CMpanion* this little problem is taken care of automatically.

CREATING SOUNDS

Creating sounds is the main *raison d'être* for voicing software, and is nearly always the first port of call for a potential user. The MT-32 generates sounds by using a combination of 'partials', which are very short samples of real instrument sounds or waveforms. These can be linked together in a variety of combinations up to a maximum of four partials. Each of these partials can be shaped, the term is a sound 'envelope', which alters the amplitude, tone and pitch on a time base from when the note is first struck. For example, the shape of the amplitude envelope will determine if the sound comes in fast or slow, fades away or hangs on when you take your hand off the keys and so on. The time-honoured method of doing this is to use a graphic display: an active screen area where you click on a point of the graph and drag it about to alter the shape and hence the sound. Obviously there are many other parameters that need to be altered to create sounds: the pattern in which the partials are interconnected, the actual sound of the partials, their individual tuning

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BEGINNERS — BEGINNERS START HERE — BEGINNERS

I thought that MIDI could only be used to create pieces of music using sequencing software. How do these voicing programs work?

They use a part of the MIDI language that is especially reserved for talking directly to the part of the synthesizer or tone module that creates the sounds. This is called 'Systems Exclusive'.

But why should I want voicing software? My synth is complicated enough without all this additional hassle.

Exactly. Most synthesizers are so complicated that even the experts find them difficult to master. However, the sort of voicing software that is around now has help in the form of a 'randomise' function. This creates sounds for you, and by experimenting with the very visual displays on-screen you can easily make your own custom sounds.

But my synth is already full of sounds, so the only way I can store new ones is by purchasing a special card that fits in a slot. I'm told that they cost nearly £100.

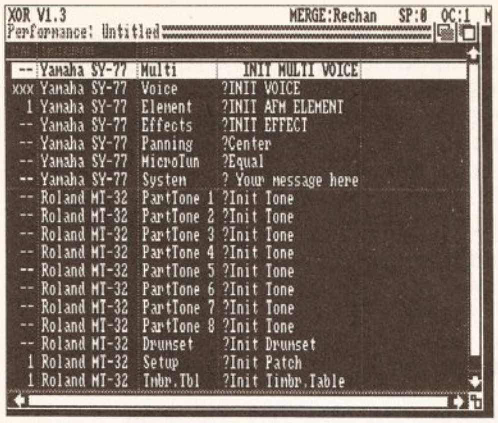
Good voicing software will save you buying a card. Not only will the software create sounds but it will also save them on disk in the form of a library. You should be able to store all the sounds in your instrument on a disk and add new ones whenever you like. In this way you can fill your synth with the sounds that really take your fancy or that fit the music you are creating.

Great. My friend has a Korg M1 synth so now I guess I can pinch all his sounds and load them into my Roland D-110 module.

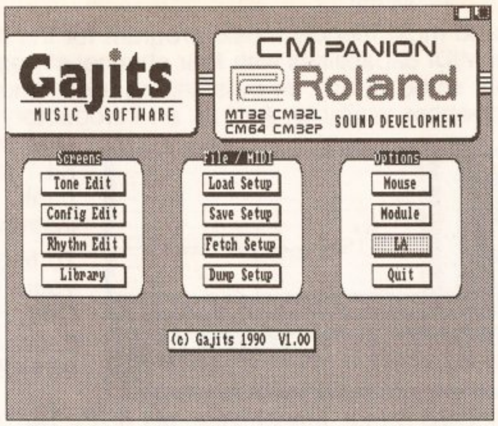
Sorry, but you can't do that. The way that one instrument creates a sound is very different to another and the data is simply not compatible at all. In fact there are very few instances where one instrument's sounds can be loaded into another, even if they are the same make. If you like, the fact that the data is termed 'exclusive' means that it is special not only to that make but also the actual model of instrument.

Will I need a separate voice programmer for each instrument?

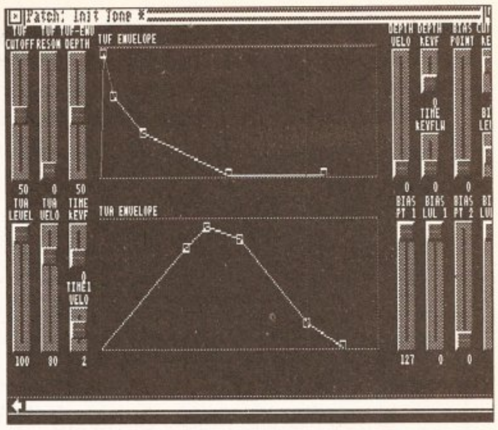
Well, you might. On the other hand there are programs that cater for three or four closely related instruments and as you will see in the main text there is one program, *X-Or*, that has the ability to work with virtually any synth. If you plan on having a large set of instruments this might be the best way forward.



The multiple performance screen of *X-Or* sends out voice information over the MIDI network to every instrument in your system.



This is the opening screen of *CMpanion*, with all its options on display. From here any function can be accessed.



The voice editing page in *X-Or*. This time it's the MT-32 that is having the once-over from its very graphic interface.

and their response to the keyboard in both pitch and velocity.

X-Or displays three graphs for pitch, amplitude and filter using one big screen display that you scroll up and down, and these individual graphs can be dragged about to change the sound. As you click on a different partial so the graphs change to show how each partial is set. Most other parameters are set numerically using graphic faders, but those that are not produce an overlay window when clicked which displays all the options right in front of you. This is a very quick and informative way of getting the sound you want. All changes in the data are sent immediately via MIDI to the tone module.

In *CMpanion*, sounds are edited using a separate tone edit page. In order to squeeze all the sound data on to one screen, the program uses one graph which can be assigned by the user to display either the pitch, volume or filter and then to display that data for each partial. Again to save screen space, all other alterations are numeric as opposed to *X-Or*'s sliders. However, *CMpanion*'s method is quite a handy way of comparing the graphs of various aspects of each partial as you can flip from one to another and the screen refresh is very fast indeed. The program will also link any of the partials together so that any changes made to one section are paralleled in another. Like *X-Or*, there is a graphic representation of the way the various partials are linked; to change this you alter the configuration number. All numeric values can be scrolled by double clicking and holding the button down whilst moving the cursor up and down, or you can simply enter the value from the keyboard.

There is no menu environment in *Caged Artist*, so it's down to using the function keys to get around the program in combination with the cursor and up and down arrows. An upright bar on the right hand side of the screen will change values that are highlighted, or you can simply enter them numerically.

Caged Artist has a good screen display with two central graphs, one for filtering and one for amplitude. You can switch between partials thanks to the highlight box in the left-hand corner and drag the graphs around with the cursor. The partial is also highlighted in the structure display, so that you know what point in the construction of the sound you are editing. To copy any aspect of one partial to another, a copy screen appears which offers you a clear set of choices. The graph windows are also used to display the keyboard scaling: that is, the degree to which the pitch affects how any particular partial sounds – for some sounds you might want to emphasise different key areas. What is a very complex procedure numerically, involving setting filter key scaling and amplitude break points, becomes very simple when performed graphically from this program. The pitch envelope uses another page and again is self-explanatory with a central graph. Altogether, *Caged Artist* makes editing a sound an enjoyable experience.

DRUM EDITING

The MT-32 has a full drum kit which is permanently set to MIDI channel 10. Not many casual users know that you can 're-map' the kit to different notes, alter their stereo position individually and decide which drums have reverb effect. All this should be easy to do with the correct software, and each 'kit' should be capable of being saved to disk.

CMpanion has a very clear and easy-to-use display. A keyboard spans the screen, and can be played with the cursor even when the MIDI thru switch is on. Any key can be assigned to any drum or sound from the internal memory bank and the options are clearly marked for individual volume, panning and reverb off or on. All kits can be saved as a separate entity.

A key list on the left of the *Caged Artist* screen is flipped through via a small box at the top right. By highlighting a note you can place any sound and drum on it: the pan and volume are numerically set in the corresponding columns. A small screen keyboard also plays the drums, as will your external keyboard. Quick, simple and no problem to use at all.

X-Or has a rather poor display here, with very little information to go on. A fader controls the tone/drum number for the key you have chosen from another fader; the pan fader is the only other major control. It would probably have been better to use the pop-up windows with a drum listing, but perhaps that involved too much programming. The method employed is certainly lacking in finesse, and you can't switch the reverb off for any of the drums.

MULTIPLE SETUPS

These are sometimes called Configurations or Performance Memories, depending on the synth and software, but the general idea is that you can create and save a global setup, perhaps to be used with one particular piece of music. The MT-32 can play up to eight parts simultaneously, along with an additional drum part. These need to be easy to create, check and save, with options to pan any part and set the volume both for individual parts and overall. The reverb controls and any other effects that are present in the instrument should be on display here, so that they are stored as part of the global data.

The Performance window in *X-Or* has separate sections for each tone in the setup. To create a setup is quite easy. To call in separate voices simply load up a bank of sounds, highlight the part number and click on the voice in the bank window. Having set them all up you go to a Setup Edit page which uses copious numbers of faders to trim the balance, tuning, pan and reverb to your requirements. Saving this total performance window, perhaps using the name of the song in question,

continued on page 107

FEATURES COMPARISON

(Editing the Roland MT-32 Sound Module)
All scores rate out of 5

	CMpanion	X-Or	Caged Artist
Drum Edit	3	1	3
Tone Edit	2	2	3
Performance Edit	3	3	3
MousePlay	1	3	3
Randomise	2	1	1
Print out	0	3	3
Partial Save	0	0	3
Bank Save	3	3	3
Tone Save	3	3	3
Drum Save	3	3	3

continued from page 105

will ensure that the whole setup is sent every time it is required.

CMpanion has a very clear presentation, with all aspects on view. The window of the setup is actually display-only and non-active, but by clicking on any of the other areas you can quickly adjust the sounds: volume transposition fine tuning, pitch bend, pan, MIDI channel and reverb. The 'reverb global' setting is also here in a separate window. This is a very easy screen to use, helped by the voice banks that pop up when the voice is clicked. Any voice in the tone bank can be transferred by merely clicking on it, which makes creating a setup extremely rapid. Perhaps it could be improved by having the setup window area active for the other peripherals instead of going to the 'select part' box in the screen lower right, as you can be playing one sound whilst reading the display of another.

Caged Artist's setup page has a central window with the eight sounds listed and their attributes running to the right in columns. Click on any one and you play it instantly. However, you have to use the right-hand scroll bar to place different sounds in the parts, and this can be time consuming – particularly if you are not too sure where they are in the voice banks. If you know the voice number you can enter this directly. The global reverb setting is accessed from here as well.

RANDOMISE

I'm not totally convinced about the randomise functions in *X-Or*, which appear to rely on you deciding which areas you want to randomise. I would much prefer an approach which looks at the synth's parameters as a whole and 'intelligently' decides which ones to attack given an overall guideline – smooth, bright, weird or whatever. This would be far more user-friendly and not make what is supposed to be a boon for the user into a somewhat uncertain process.

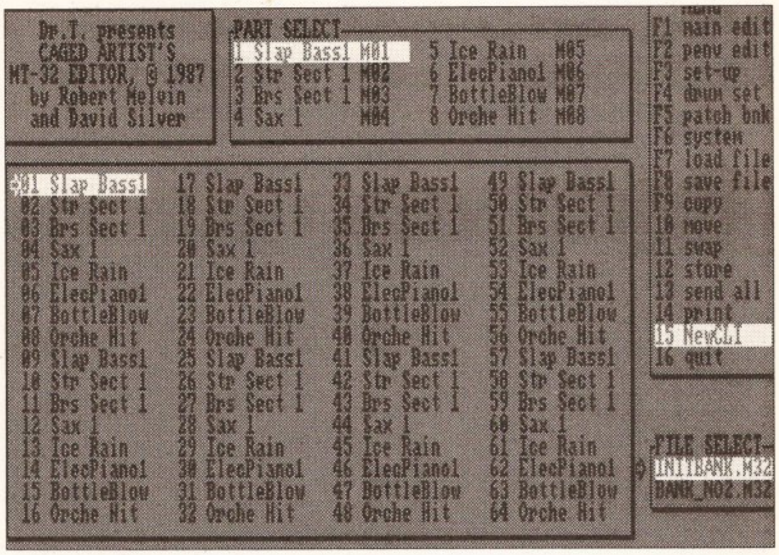
This approach was echoed by the other programs, which tended to assume a reasonable knowledge of programming which most users probably haven't got.

LIBRARY FACILITIES

Caged Artist allows you to save individual partials, which means that you can merge parts of one sound with another. *CMpanion* won't do this, and neither will *X-Or*. All the programs will save entire setups, banks of tones or individual tones and drum kits, and there is no real problem in any of their disk operations or the construction of new banks from others. However, you should be aware of *X-Or*'s ability to give each sound an attribute and search through its files, when so requested, to find sounds with particular characteristics.

PLAY IT AGAIN, MOUSE

All three programs have the ability to play the notes from the screen by using the mouse. Pitch is left to right and velocity is bottom to top. *X-Or* goes one further in that you can choose what scale you want to work in and test out other MIDI controllers for the sound – sustain, breath, and so on. With *CMpanion* you can play with the mouse or from the connected keyboard, but there doesn't seem to be a way of using both simultaneously. Both *Caged Artist* and *X-Or* merge and 'rechannelise' the incoming notes from an external MIDI keyboard; it doesn't matter what MIDI channel they come in on.



The opening screen of *Caged Artist* which does not use Workbench, although you can still multi-task from a CLI window.

MULTITASKING MEMORY

Of course, you could go the whole hog and have a sequencer running simultaneously if you have enough memory. *Caged Artist* takes up about 250K of memory and will run with Gajits' *Sequencer One* quite happily since you can return to a CLI and from there to the Workbench. The same is true of *CMpanion*, which occupies a similar amount of RAM.

X-Or needs a little more memory, just over 300K, but refused to load any screens other than its performance memory with a sequencer resident in the memory of a 1Mb Amiga. To use the full force of multitasking with *X-Or* you would need at least 2Mb of memory and it would be best to use it with another Dr T sequencer as they enjoy a high level of compatibility and can transfer data from one to another directly.

OTHER CONSIDERATIONS

Caged Artist has a 'print out' feature but doesn't seem to want to multitask very easily. Some *Caged Artist* software will run with several related synths but in the case of the MT-32 you can only work with the one module.

CMpanion is will work with the Roland D-5, D-10, D-20, D-110, MT-32, CM-32P, CM-32L, and CM-64. This is a rather impressive list and apart from broadening the sales base for the program it may also save you buying another piece of software should you add one of these items to your system (The CM range was specifically designed by Roland for use with computers). However, you can't print out any of the voice banks unless you can graphically print out the Amiga screen using a screendump utility.

X-Or has numerous other features. You can blend and mix voices together from the same synth or copy groups of sound parameters across from one sound to another, it can search for sounds and it will also load in sounds from any of the *Caged Artist* series and print out both performance and voice bank data. Thanks to its multiple window environment, it is not too hard to get from one area to another quickly.

WHAT INSTRUMENTS?

Caged Artist series: these have been running for some years, and cover a wide range of synths – Casio VZ and CZ series, E-mu Proteus, ESQ1, Yamaha 4 Op FM, Kawai K1 and K5, Korg M1, Oberheim Matrix 1000, Roland D110 and MT32.

X-Or: it would be easier to list the instruments that this application can't yet program! If you have something that is a little obscure you could write to either the UK distributors or Dr T directly in the States. Other than that, it can cope with over 90 synths and there are more profiles regularly available.

At present, Gajits' only voicing software for the Amiga is the *CMpanion* as covered here, and this program only works with the instruments listed earlier.

FURTHER TESTS

Although the main comparison has been done for these programs using the MT-32, I tested out two other synths that work in very different ways to see how these fared. First, the Yamaha DX 100.

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JARGON BUSTING

Algorithm – Yamaha's term for the configuration of operators (*qv*) to create sound.

Envelope – The shape of a sound. This can apply to either pitch, amplitude or tone (filtering). If applied to amplitude it defines at what point in time the sound increases or decreases in volume from the point when the note was struck.

FM – Frequency Modulation. The elder statesman of digital synthesis, as developed by Yamaha. It originally modulated sine waves to create complex waveforms.

Operator – a block of sound in an FM sound algorithm that can be shaped individually.

Partial – A short, sampled section of sound as used by Roland in its synthesizers as a building block for synthesis.

Structure – The configuration of partials that create a sound.

Systems Exclusive – The part of the MIDI code that transmits data which usually carries direct information to program the sound chips. It will only apply to the make and model of instrument it is addressed to.

Tone – Can also be termed as a 'timbre'. Usually applied to one sound in its entirety.

Unit Number – Sometimes called a Device Number. The Systems Exclusive number/channel required by some instruments before they will 'talk' to the computer.

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The DX 100 is now several years old, and is only capable of producing one sound at a time, but like all FM synthesizers it is not easy to program. The basis for creating sound is four separate sine waves (called 'operators') which can be given different frequencies and sound envelopes and then arranged and connected in different configurations (called 'algorithms'). The sound produced is a result of the sine waves modulating which produces an extremely complex final wave form.

Gajits has no software for this range, so the comparison must be between *X-Or* and *Caged Artist: 4 Op Deluxe*, which will also program the TX81Z, FB01, DX27 and DX21.

Now somewhat long in the tooth, *4 Op Deluxe* does not use a menu environment, but instead makes use of the function keys to get around the different areas of sound creation and storage.

The main screen is the sound creation page; to edit you must click on the parameter to be altered and then either key the new value in numerically or use a long upright sliding scale to the screen right – a rather tedious and long winded process. The program does tend to assume that you know quite a bit about FM programming, and relies heavily on numeric displays as it only uses one graph: the operator that you are working on is highlighted whilst the other three are represented by broken lines. It would have been better and more fun to use if it made greater use of graphic displays to control other parameters like keyboard scaling, as with the company's MT-32 editor. Although the cursor accesses screen areas, it seemed to be easier to use the up and down keys. One main problem is the algorithm configuration display, which is far too small: it is difficult to know which operator is switched on or off. The randomise seems very dogmatic and pedestrian as well.

To be fair, this program is now over four years old, and the design of voicing software has moved on in leaps and bounds since then. Having said that, the original Yamaha software (dating from 1984) that ran on that company's ill- fated MSX computers was streets ahead of this – it was extremely easy to understand and use.

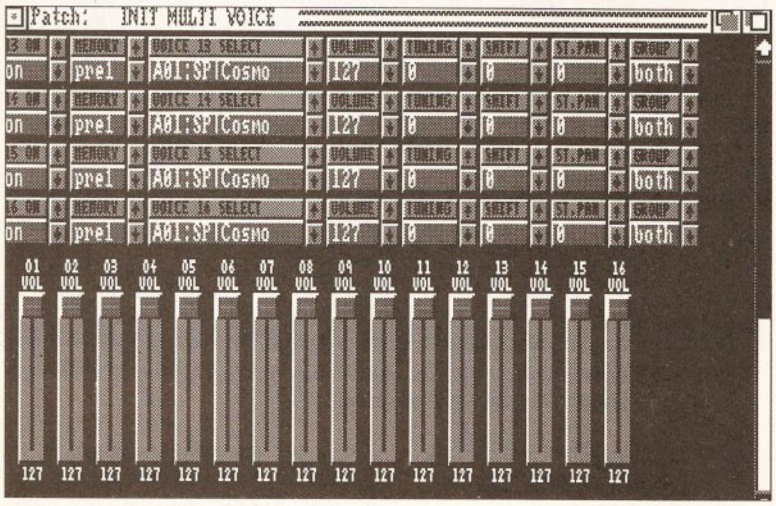
X-Or has a far superior graphic display and is much easier to access, with a separate graph for each operator's sound envelope, again using the scrolling single screen concept. Oddly enough, the algorithms are numerically described rather than graphically displayed, which is a bit of a let down, and there seemed to be no way to turn individual operators off or on – which can be very important when you are building up sounds.

Thanks to the pop-up windows, all parameters which are not controlled by the faders are extremely easy and quick to change and in general the process is fairly self-explanatory. The help page is not much use, though. Generally this a much easier approach than *4 Op Deluxe* and although not the last word in programming the DX 100 it is certainly not a second-rate one.

The ultimate test could only be carried out using *X-Or*, and this was on the Yamaha SY77, the company's current flagship synth and one of the most complex synthesizers to date (disregarding £500,000 bankruptcy winners like the Synclavier).

I have only ever seen one dedicated voice programmer and librarian for the SY77 (running on any computer) and this is certainly the first time that the Amiga has been given an opportunity of taming its innermost secrets. Without going into too much detail, the SY77 is capable of creating sounds by no less than seven different synthesis methods, using combinations of FM-created sounds and sampled sounds. There are multiple voice files, micro tuning tables, pan tables (the panning process is rather like a separate miniature synthesizer!) as well as individual voice files.

X-Or's help page, which in itself is several screens long, has a small caveat which warns that this has not been fully tested. At present, the program is a bit stumped by the SY77 and tries to do too much, perhaps at the expense of the basic problem of programming an individual sound. As it was, it failed to retrieve individual sounds from the instrument and one or two functions simply failed to work. The voice programming screen left out areas like the graphic control of sound envelopes, which made sound creation rather impossible. I suspect that it will take several upgrades of this profile before SY77 is completely mastered. In fairness, it is heavily rumoured that the MIDI data supplied by Yamaha is inaccurate, which is a rather bad starting point anyway.



Setting up a multiple voice patch for the SY77 in *X-Or*. The faders individually adjust the volume for each of the 16 parts.

IN CONCLUSION

X-Or really requires a high-res screen to read the descriptions of the parameters. If you are a beginner then I think you would have to be prepared for quite a long indoctrination process, as you will need to know how each synth addresses MIDI before you start, not to mention the many faces that this powerful program has. To this end, perhaps the help pages could be more useful, since you could print them out and use them as brief guides to your instrument. For someone with a little knowledge, though, it is a very powerful control centre with seemingly no limit. Not perfect in every respect when it comes to programming but a superb program and, well, it's a nigh ultimate tool. AS

SHOPPING LIST

Caged Artist MT-32/4 Op Deluxe...£59

X-Or...£219
by Dr T Music Software,
100 Crescent Road,
Needham, MA 02194 USA
☎ 010 1 617 455 1454
Distributed in the UK by
Zone Distribution,
5 Abbeville Road, London SW4.
☎ 081-766 6564

CMpanion...............................£99.99
by Gajits Software,
I-Mex House, 40 Princess Street,
Manchester M1 6DE.
☎ 061-236 2515

CHECKOUT CMPANION

Documentation ●●●●●
Well written with the beginner in mind.

Functions ●●●●○
Comprehensive and business-like.

Speed ●●●●●
No problems here.

Ease of use ●●●●○
If the tone editor was more graphic it would score higher.

Price ●●●●●
Good at £99.99, as you are getting software for lots of instruments.

Overall rating ●●●●○

Although the program could be slightly improved in a couple of areas, it does cover several synths very well, with the minimum of fuss.

CHECKOUT CAGED ARTIST MT-32

Documentation ●●●●●
Clear and easy to follow.

Functions ●●●●●
Comprehensive beyond the call of duty.

Speed ●●●●○
Some odd quirks in data entry.

Ease of use ●●●●●
Clear graphics, hence high rating.

Price ●●●●○
£59 is a fair price, but the program only works with one synthesizer.

Overall rating ●●●●○

A well-balanced program; it's just a pity that it can't work with the other similar Roland products.

CHECKOUT X-OR

Documentation ●●●●○
Makes a fair attempt at a very complex program.

Functions ●●●●○
Utterly brilliant in general; some editors are suspect though.

Speed ●●●●●
Very quick and responsive

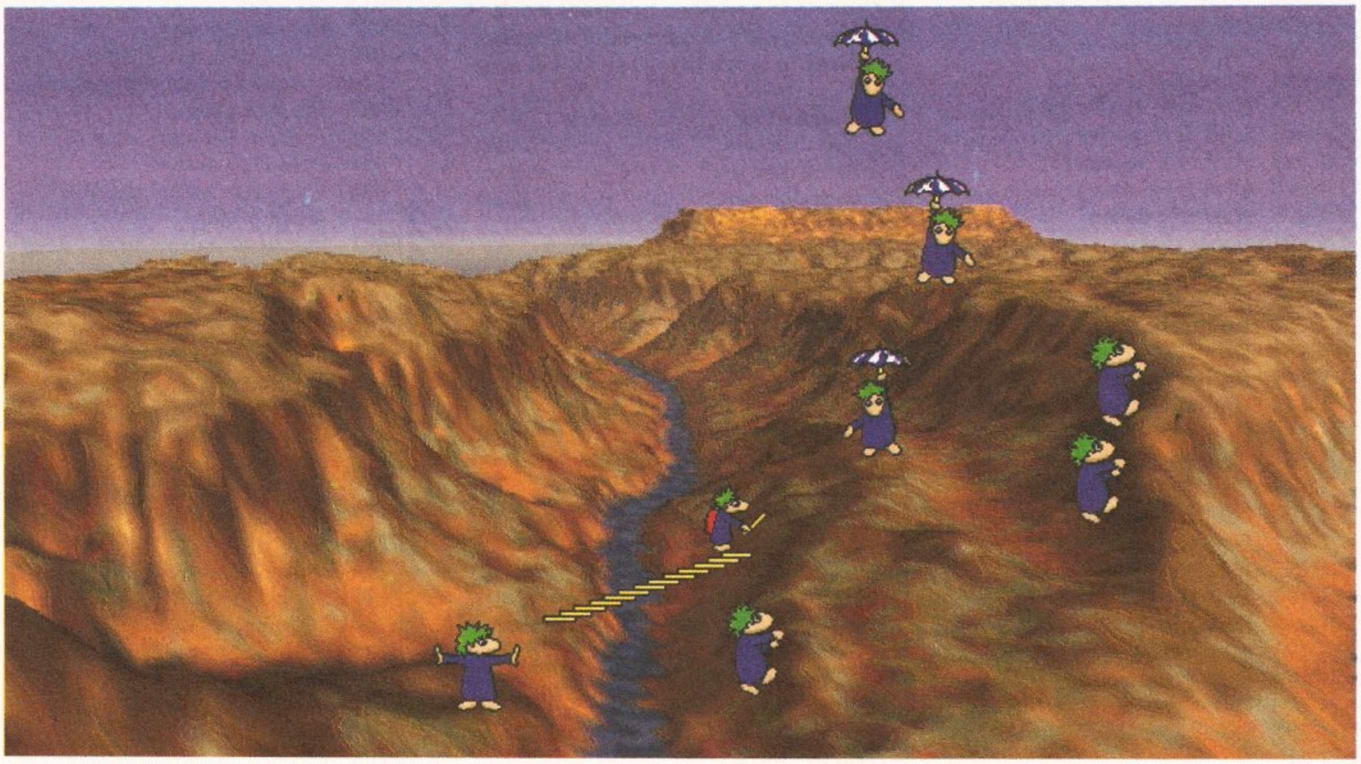
Ease of use ●●●●○
You'll need time to absorb all thefeatures.

Price ●●●●●
£219 is more than fair for what you get.

Overall rating ●●●●●

Actually, perhaps four and a half out of five, but the program increases to a five out of five rating as you get to know it. I only really have one complaint – get those editors sorted out!

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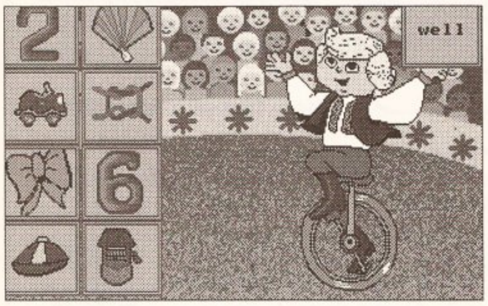
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Live and learn

Last month we had a glimpse at the educational titles available from the public domain libraries. Since then another crop has flooded in, but the commercial sector is strangely silent – one new title from America, one from Britain and one budget re-release. Where are all the home-grown producers? Have they gone over to embracing the PD, shareware and licenceware ethos?

For customers like us this wouldn't be a bad thing at all – after all, who wants to pay inflated prices – but surely it's time some of the PC and BBC titles were converted to the Amiga so that we can use them at home. One type of program used extensively in schools is strangely missing from the home-computer range – text/graphic adventures. Are there any budding programmers out there who fancy a challenge?

Once again our education correspondent, Pat Winstanley, brings you details of the best in educational software



This *Big Top* juggler needs the matching card to make a balanced exit from the ring.

With languages such as AMOS and HatrackII available, the opportunities are wide open. Many children tire quickly of the 'guess the spelling' or 'do the sum' type of offering which is becoming universal. With a limited number of arcade approaches, educational games are rapidly approaching the 'oh no, not another clone' tedium of shoot-em-ups. Come on programmers, let's see some variety – who knows, you might enjoy the change too!



"Don't know what to buy? Read on for news of the latest educational software and what features to look for."
Pat Winstanley

BIG TOP FUN

Infant/Junior
LPD29 (1Mb) £3.50

Len Tucker's at it again with two new products this month. This one has a circus setting (if you hadn't already guessed) and consists of four tasks for infant/junior children.

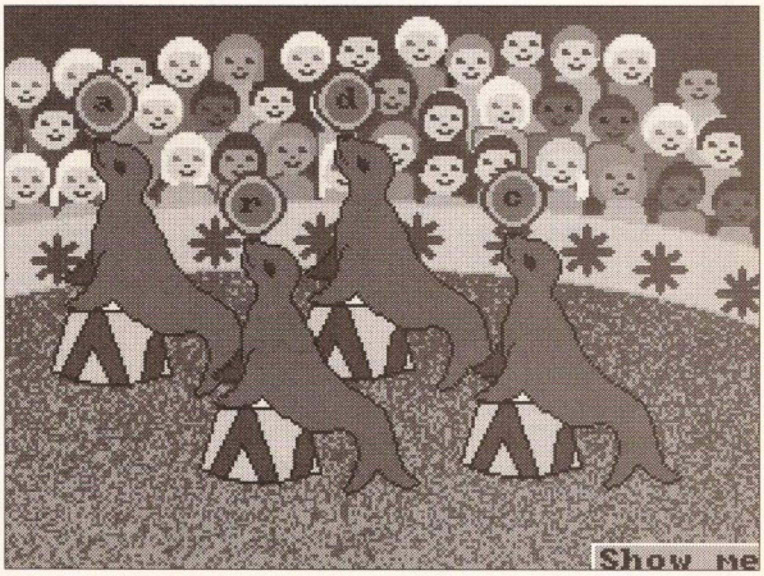
Word Balance has a monocyclist entering the ring with a card in one hand. Also in the ring are a range of other cards. Depending upon the skill level chosen, the child is asked either to choose a word to match the picture or a picture to match a word.

If speech is selected, the child's choice of card is spoken by the computer – which both spells it out and pronounces the complete word. This slows the game down somewhat, but with youngsters it's no real problem. The only difficulty is that the computer does not give the phonetic letter sounds but their names – confusing for little ones.

Matchplay is the next offering, and is a simple memory game with different cards to be turned over to make pairs. Different levels see either pictures or words on the cards. Again, speech is available, with the computer sounding out the spelling of either the word or the word represented by the picture.

Seal-a-Grams are, as the name suggests, anagrams. A nice twist is that the screen shows several seals juggling balls on their noses. Each ball contains a letter and the child must make a word by swapping balls amongst the seals until the correct

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Circus seals play ball with each other according to which pair are clicked on. If you're stuck, clicking on SHOW ME reveals a clue to the *Big Top* problem.

BEGINNERS — BEGINNERS START HERE — BEGINNERS

There's a great deal of good educational software about on the Amiga, so which should you choose for your brood? Before spending a small fortune, think about what your child needs, what he or she can handle in the way of controls, and estimate how much computer and game supervision will be needed.

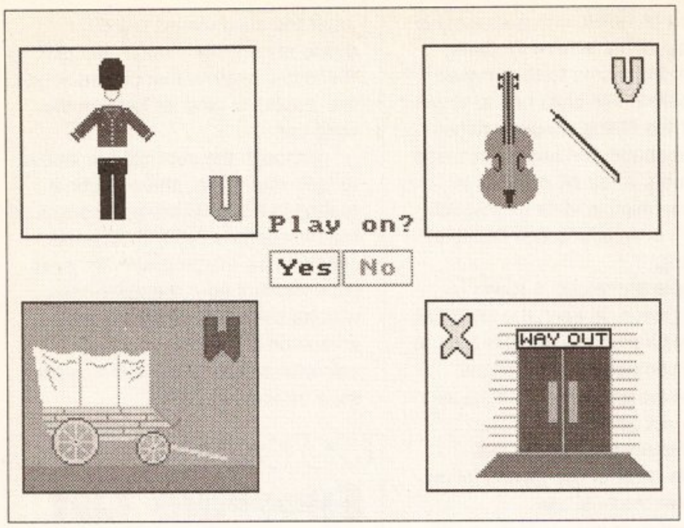
Small children can usually handle a joystick or mouse without difficulty, but pre-readers in particular may well be baffled by the keyboard. Better-quality games will have a choice of control whenever possible, including an alternative qwerty or number pad layout on the screen to be used in conjunction with the mouse. Older children – particularly those comfortable with the keyboard – usually find direct typing is quicker and easier in spelling games.

While older children can safely be left to handle loading, saving and swapping disks, younger ones need a good deal of supervision at first. Games which require lots of disk swapping can be very frustrating for parents, especially when the actual program is extremely simple to operate and the child could theoretically handle it alone.

Spelling games in particular usually need parental help for the child to get the most from them. Some of the better ones include on-screen help (giving clues, refusing to accept wrong answers and so on) which gives the child independence and hence pride in their achievements.

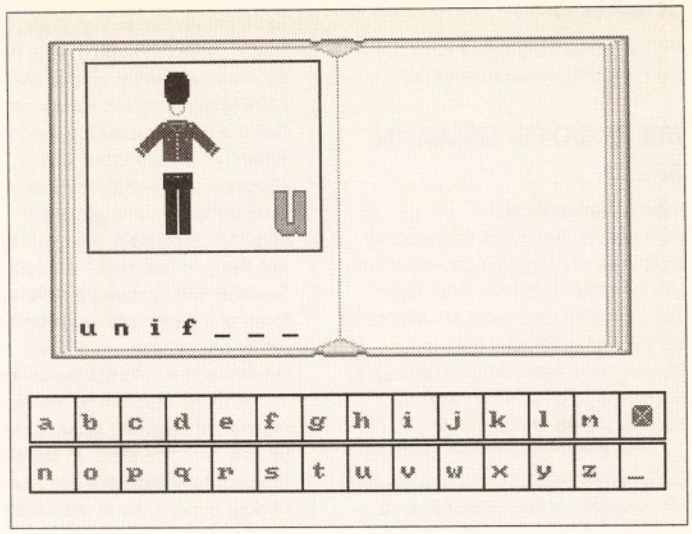
Many programs include a progress recorder. These are useful for monitoring a child's progress both by parents and by the children themselves. Some allow several children to keep session-by-session records individually on the same disk. Be wary of permanent records, though,as this means saving to disk, and more swapping.

Where possible choose software which can be backed up so that the original disk can be put away in case of mishaps.



Nice, clear pictures and easy-to-guess words help children enjoy *Spell Book.*

In *Spell Book*, the words and pictures build up a book of ABC by clicking letters with the mouse.



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letter order is reached. On-screen help is available in the form of a picture depicting the correct word, and as with the others speech is available if required.

Balloon Burst gives the kids a chance to test their reflexes along with their spelling. The scene shows a line of balloons, each containing a letter, a picture of the required word and a clown walking back and forth across the ring. The clown has a water pistol which pops any balloon he is directly beneath when the mouse button is pressed. If the letter is correct for the word required (not necessarily in the correct order) the word begins to be built up on the ground. If it is incorrect the letter simply disappears. One difficulty with the approach used is that simply by firing randomly the child can make a word. I'd have liked to see some sort of penalty (or "cheat") message to dissuade the child from making use of that method.

Overall the disk contains a well thought-out variety of games, none of them too demanding. All of them have excellent graphics, animation and speech (except for the lack of phonetics). There is circus music playing during the games, adding greatly to the atmosphere – play really feels as though it's taking place in the ring. Suitable for all primary age children, it's a snip at the price!

CYAD

Junior/Senior
LPD26 (1Mb) £3.50

James Newcome, a new name to me, describes himself as "living as an unhappy single with an apple strudel". But don't worry about this minor eccentricity, it hasn't deterred him from using AMOS to produce a superb game of logic.

CYAD is an acronym for Controllable Yellow Automated Device – but controllable is the last thing it appears to be. Once set in motion by the joystick it continues inexorably until it hits either a hazard or a solid wall. The idea of the puzzle is to send CYAD off in such directions that it will collect precious stones on the screen. Once all of the stones have been collected an exit appears – then you have the problem of reaching safety with limited steering power.

As an exercise in logic and frustration it is one of the best programs for both children and adults that I have seen for some time. Fortunately the author has included both save/load features and a tutorial mode. Unfortunately he also threatens to unleash son of *CYAD, CYADONIA* on an unsuspecting world. The follow-up is said to be the same game with more syllables in the title; can I stand any more? Yes – definitely. Well worth a look if the kids (or you) like brain teasers with a bit of action.

FLOWER POWER

Infant/Junior
LPD27 (1Mb) £3.50

Although I whinged in the introduction about the lack of educational adventure games, this one comes close to that ideal. The scenario involves your attempts to grow flowers for the local show while discouraging various bugs and beasties which are out to eat or otherwise destroy your efforts. Successful gardeners in the real world must carry out a variety of tasks in a specific order, and this game needs the same criteria for successful progression.

Initially you are presented with a packet of seeds, a spade and a watering can. You must dig a plot of ground, plant the seeds, water the seedlings then harvest it when ready – sounds easy, doesn't it? Unfortunately a variety of pests from dogs to bees will eat your seedlings if they get close enough. Being a kind soul, you don't resort to pesticides or other environmentally unfriendly products, but rely instead on scaring the blighters with karate-style war cries.

On each level you have a limited number of seeds and a target number of harvested flowers to reach. You also have a limited amount of energy which is depleted when a beastie comes into contact. Between guarding your plots and frantically refilling the watering can, both kids and adults will find that fun, challenge and logical thought need to go hand in hand for success. All the action is controlled by the joystick and is simple enough for quite young children. A lovely (though probably unintentional) touch is that the gardener appears to be watering the plants without the aid of a watering can...

SPELL BOOK (4-9)

Infant/Junior

This is a budget-priced re-release from Soft Stuff, combining two packs which have been around for quite some years. Although the basic program has not changed, the whole package has been streamlined to simplify operation.

Each letter of the alphabet has a picture associated with it, and the child's task is to work out the spelling of the object pictured. The alphabet is split into groups of four letters, and each group can be chosen at random, allowing the child to work through in any order. Several levels are available, each with a different set of pictures, making the program suitable for infants and juniors alike.

My children used this program on the Atari ST several years ago (they were at pre-school and reception ages) and they thoroughly enjoyed it. This new version has proved just as much of a hit, despite their improved reading ability, which just goes to show its versatility across age groups.

Letters for words are selected by the mouse from an alphabet shown on the screen – it's a slow method, but one ideal for children unfamiliar with the qwerty keyboard. The letters on the screen are displayed in lower case to match the target age groups.

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RATINGS

	Educational Value	Ease of Use	Flexibility	Addiction	Overall Value
CYAD	3	4	2	5	3
Robot Spell	5	3	4	2	3
Big Top Fun	5	5	3	3	4
Flower Power	4	3	2	5	4
Early Maths	5	2	3	4	4
Spellicopter	5	3	2	3	3
Spell Book	4	3	2	4	3

Successful educational programs, especially those intended for children, need to combine fun with learning. A good educational rating combined with addictiveness shows a well-balanced and valuable resource. Other ratings shown here affect the user-friendliness of the product, reflecting the hassle-factor involved.

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At the meagre price of £7.99 it's well worth adding to your collection.

MR ROBOT'S SPEAK 'N SPELL

Infant/Junior/Senior

One by one, American educational programs are beginning to filter into this country. This one, from Brain Technologies, is aimed at children of all abilities and ages from kindergarten (early infant) through to college, and describes itself as a vocabulary expander.

The program is in two sections. Early levels (approximately equivalent to our infant school ages) flash a picture on the screen then ask the child to type in the spelling (either with the keyboard or by mouse with an on-screen keyboard). Incorrect letters may not be entered – the computer (in the guise of a robot, of which more later) tells the child to try a different letter. Later levels (approximately junior school ages) have crosswords to be filled in.

Each section comprises a tutor and a quiz mode. The tutor mode presents the word on-screen, while the quiz expects the child to remember or work out the correct spelling. Tutor and quiz mode go hand in hand, the same words and pictures being used for a particular level in both cases. My seven and eight year-olds found this a great help – especially when they encountered unfamiliar words and spellings due to the Americanisms.

The words themselves range from easy-peasy such as 'cat' through to horrible specimens like 'palanquin' and 'ocarina'. I thought my vocabulary was pretty good but had to look up both the latter words (they mean a litter and a musical toy respectively, in case you're curious).

With such a title you might be forgiven for expecting robots to play a major part in the presentation. Well, they do – but it isn't good. Anyone who has seen or heard *Hitchhiker's Guide to the Galaxy* will recall Marvin, the paranoid android. This program features Marvin's brother and sister, and they're even more depressing to listen to than Marvin was. Both the children and I found ourselves sinking lower and lower as the game progressed – hardly conducive to maintaining interest. It isn't just that the speech is very slow; most of the phrases seem to drop in pitch at the end rather than rising to enthuse the player with determination.

One major difficulty with American programs aimed at teaching English is the problem of different spellings and meanings between the two sides of the Atlantic. Thus, several words in the list have American spellings; tire (tyre), pickax (pickaxe), vise (vice), for example, while others are completely different words; faucet (tap), cookie (biscuit), elevator (lift). Adults who have been widely exposed to American novels will have little difficulty translating but children, especially younger ones, are likely to find much confusion. Despite early exposure to American films and game shows, everyday items are seldom mentioned and therefore the differences unknown.

Another problem is the American method of teaching upper-case letters from the start. In Britain lower-case characters are used almost exclusively in the infant school, but in this game upper-case is used on-screen even at the infant age levels.

With over 1,000 words and associated pictures there's plenty of scope, but the presentation is so tedious that only the most tenacious child will remain interested for long, and for older children/adults the program runs far too slowly between words, yet far too fast during a word. The program also has a habit of crashing – which is unacceptable in PD, let alone full-price products.

EARLY MATHS

Infant/Junior

Kids love programs with cute characters, a phenomenon used to good effect in this collection of maths games. Dizzy Lizzy is a blue blob, while her arch enemy is a red blob, Meany. Throughout the range of tasks, the child has to help Lizzy outwit Meany by answering various maths problems.

The disk contains 12 games, ranging from simple counting through to addition, subtraction, division, multiplication, shapes and logic. Also covered are 'greater than', 'equal to' and 'less than'.

Shape recognition appears in a simple 'Snap'-style card game (with Meany wild cards to add a bit of spice). Another shape game is in the style of *Space Invaders* mixed up with a bit of *Tetris*, with a spaceship at the top of the screen dropping different shapes on to the shaped bases below. The child has to check whether the falling shape matches the base shape and shoot out those which don't. A fair bit of reflex is called for which is ideal for joystick jockeys – even adults can find this one taxing.

Simple arithmetic is found in several games. In each the child has to answer a problem to allow Lizzy to achieve something. Thus in one, each correct answer gives a jigsaw piece to put back together the picture Meany has vandalised.

While most of the games follow well-known themes, the implementation is excellent and all the testers maintained high interest levels. My only real gripe is that after each attempt at a task (of around ten questions) the program puts the child back to the main menu rather than offering another go at the same game. Since this takes quite a while, and kids take a while to learn the gameplay methods, it tends to be rather frustrating. However, that minor design point apart, I can heartily recommend this offering for any family with primary-aged children. It is flexible, fun, and above all excellent value.

SPELLICOPTER

Infant/Junior

Spelling games tend to be the most boring around, both for children and teachers. *Spellicopter* is one of the better ones, and uses animation effectively to pull a tedious task out of obscurity. Although simple in concept, its animation adds greatly to the child's enjoyment, and its flexibility of control means that little intervention is needed from mum and dad.

Basically the game is about spelling words by means of either joystick or cursor keys. Using the controls, a helicopter is manipulated along the alphabet which is strung out and scrolling across the screen. When the helicopter stops over a letter the child makes a grab descend from the 'copter and pick up the letter. Another manoeuvre sends the 'copter to drop its load on the word line.

Although the controls are limited to 'get' and 'drop', there is still a feeling of the child being in control of the helicopter's flight. Even small children use the program with ease yet it doesn't bore the older ones with its simplicity. Graphics and animation are simple, but very colourful and realistic with a cartoon-style atmosphere. AS

SHOPPING LIST

Big Top Fun £3.50
Flower Power £3.50
CYAD £3.50

Available under an identical numbering/pricing system from all AMOS Licenceware distributors. See ads elsewhere in this issue for details.

Mr Robot's Speak 'n' Spell £25
(This is an approximate price – the final price is not yet set, but the game is available now – ring for details)

Available from HB Marketing
Unit 3, Poyle 14
Newlands Drive
Colnbrook
Slough SL3 0DX.
☎ 0753 686000

Early Learning Maths £19.95
Spellicopter £19.95

Available from ESP Software
32A Southchurch Road
Southend-on-Sea
Essex SS1 2ND.
☎ 0702 600557

Spell Book (4-9) £7.99

Available from Soft Stuff
19 Quarry Hill Road
Tonbridge
Kent TN9 2RN
☎ 0732 351234

EDUCATIONAL CONTENT

	Maths	English	Science	Reflex	Logic	Fact	Revise
CYAD	N	N	N	Y	Y	N	N
Robot Spell	N	Y	N	N	N	N	Y
Big Top Fun	Y	Y	N	Y	N	N	N
Flower Power	N	N	Y	Y	Y	N	N
Early Maths	Y	N	N	N	N	N	Y
Spellicopter	N	Y	N	N	N	N	Y
Spell Book	N	Y	N	N	N	N	Y

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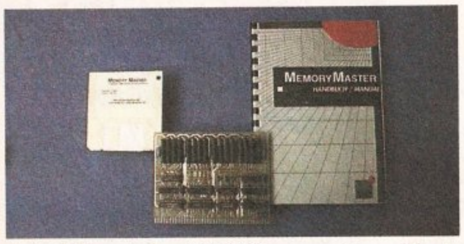
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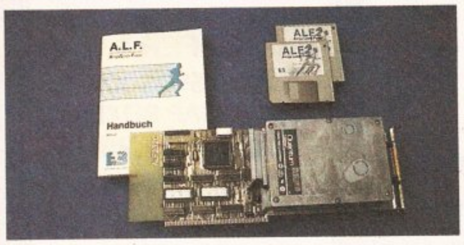


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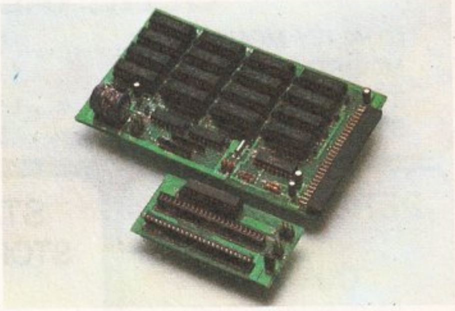
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COMMparing packages



"You've bought your modem, and now it's sitting by the side of your Amiga looking smart. All you need is some software to make your computer talk to it. And that's what I've been looking at this month."
Stewart C Russell

Stewart Russell takes a look at four of the major players in the comms software market – and is rather surprised by the results...

BEGINNERS START HERE

Why do I need a comms package?

Modems need to be told exactly what to do, like 'dial a number and wait for another modem to reply'. You need some way of seeing what the modem is receiving, and a means to enter commands to the computer at the other end. A dumb terminal can take care of the input/output operations, but a comms package will keep track of things like dialling the remote system and using the correct binary file transfer protocol as well.

So why can't I just send a binary file straight down a phone line?

Well, you could if you could guarantee absolutely no telephone line noise and that the receiving modem was in perfect synchronisation with the sender. This is, of course, impossible, so we have to use file transfer protocols which repackage and check the data as it is sent.

What would anyone use a script language for?

A simple script could automate logging on to a board, spool all the new messages to disk and log off, allowing you to compose replies off-line. A more complex script could log on to a financial services system, gather share prices, log off, and process the data using a spreadsheet. This second example would probably require an ARexx-compatible terminal and spreadsheet, though. Writing good scripts is quite an art, as there are so many things which can go wrong in an automated modem connection.

In the beginning, comms both hurt and helped the Amiga. The hurt came from unscrupulous types spreading what little commercial software there was via dubious bulletin boards. More honest comms users helped the fledgeling Amiga community by spreading news, answering questions and distributing public domain software.

2,400 baud was a luxury then, and the early Amiga comms packages were extremely rudimentary. The scene gelled with the release of DJ James' *Communicator* program – a reliable, simple piece of software distributed with full C source. Here was a solid base on which more complicated terminals could be built.

These days, modems have advanced so much that the serial port of a stock Amiga has extreme difficulty driving them at top speed. Error correction and data compression allow transmission rates of a hundred times that of the old 300 baud modems, even along Telecom's foosty old lines.

Thankfully, comms software has advanced along with the hardware. Users now expect advanced transfer protocols, colour graphics, scrollback buffers, call timers and other convenience features. These won't

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JARGON BUSTING

ANSI Graphics – A set of character control codes which allow (usually eight) colour block graphics and simple animations.

ASCII Capture – A feature which allows all the text received from the modem to be stored in a file for later perusal.

Kermit – A protocol much used in mainframe communications. Very slow, but immune to almost any amount of line noise.

Protocol – Any agreed standard way of transmitting data in order to minimise the corrupting effects of telephone line noise.

Script Language – A mini programming language built into a comms package. Allows repetitive tasks to be automated and, with care, can dramatically reduce on-line time.

Tektronics – A vector graphics and text standard widely used in scientific institutions and absolutely never used on bulletin boards.

VT – A family of character control code sets devised by DEC. VT-100 is the most common, and is the basis for the ISO control code standard used by the Amiga.

X-Modem – A rather slow and ancient protocol which is supported by virtually every bulletin board. Sends data in 128-byte blocks with a checksum byte.

X-Modem-CRC – Similar to X-Modem, but uses a 16-bit Cyclic Redundancy Check instead of the checksum for better error detection. Slower but more secure than X-Modem.

XPR – A system of external protocol libraries peculiar to the Amiga. It allows any XPR-compatible comms package to take advantage of any of the XPR protocols, without ever needing to know exactly how each protocol works. *NComm* uses it extensively.

Y-Modem – X-Modem-CRC with 1,024-byte blocks. Fast when used on good phone lines. Various other versions, such as Y-Modem G and Y-Modem Batch, have been developed to improve the transfer rate.

Z-Modem – A Y-Modem variant which alters data block size to accommodate patches of line noise. Batch file sending is possible, and cancelled transfers can be resumed without error. Z-Modem is currently the best general-purpose protocol available.

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help you make a connection (only a reliable modem will do that) but they certainly do assist in the best use of your precious on- line time.

There are many, many comms packages for the Amiga. Instead of looking at all of them – which would be rather impractical, and would probably take up most of the magazine – the top two commercial packages are compared with the their shareware opposite numbers.

A-TALK III

According to Oxxi, *A-Talk III* is a 'total communications package'. It attempts to give you all the comms software you'll ever need, including the small but vital auxiliary utilities, such as file archivers and the like. The only disadvantage with this approach is that the supplied utilities are now rather old-fashioned, although they will serve to download and unarchive more modern ones.

Installation went off without a hitch, since no attempt was made to alter the startup-sequence. An Assign command did have to be added manually, but this seeming annoyance does ensure that the machine will boot properly. Too many packages attempt a really clever hard disk installation routine that doesn't quite work, so Oxxi deserves praise for this simple approach.

Whoever wrote *A-Talk III* really likes Intuition gadgets. The 'quick configuration' menu boasts no less than 85 option gadgets under 26 different headings. This gives thousands of options presented in just one medium resolution screen.

While we're on the subject of screens, I would like to say that a program as expensive as *A-Talk III* should fully support PAL screens. Unless you want to stick to the four colour Workbench screen, or use Tektronics terminal emulation (which you won't), you will be sold short by the customary 56 lines.

You will no doubt need to dive into the manual for moral support on numerous occasions, and when you do you will be surprised by the clarity of the text. It explains many procedures that other manuals forget about, like logging in to different types of systems, and how file transfer protocols work.

Although *A-Talk III* has all the protocols required for using BBSs, it is really geared to mainframe connections since it offers many terminal emulations. Its modem options are uncharacteristically inflexible – you are given a list of just ten or so models to choose from, many of which are now obsolete, and most of which were never actually available in this country anyway.

A-Talk III's saving grace is its script language. Not only can it run a simple BBS host (*Online!* and *NComm* can also do this), it can also provide remote access to your Amiga via a complex ARexx script. Thus, whatever you can do in a Shell you can also do with *A-Talk* over a telephone line.

The basic problem with *A-Talk III* is its price. If it was cheaper, you could forgive its flaws, but its present cost means that its imperfections become rather more major causes for complaint.

ONLINE! PLATINUM EDITION

Available as part of the *Works! Platinum Edition* integrated system, or as a stand alone package, *Online! Platinum Edition* tries to maximise value for money and ease of use. And, for the most part, it succeeds in its aims.

Installation is very polished. First, the integrity of all the files on the distribution disk is checked, and then a slick 'Intuitionised' program asks for the installation path. The program will modify you startup-sequence to accommodate an Assign command. Unfortunately, the assignment is made without the all-important colon in the device name, so a manual fix with a text editor is required; a shame, since the install routine is superficially impressive.

BULLETIN BOARD UPDATE

Stephen Ogbourne, sysop of the Public House BBS in Cardiff, has informed me that the number of the board has changed to 0222 665907. The number given in *Amiga Shopper* issue 2 is no longer current, and should not be used.

Having fallen at the first hurdle, *Online!* recovered well in use. The program has all the features you need to use BBSs: ANSI graphics, X- and Z-Modem protocols, a call timer, and ASCII capture. It has VT-102 and Tektronics 4010 terminal emulations which, in conjunction with the rather archaic Kermit file transfer protocol, could find uses in connecting to university computers. More folks will find a use for the included CIS B protocol, as used by the huge online system CompuServe.

For some curious reason, MSS devised its own protocol, SADIE. SADIE allows simultaneous uploading, downloading and chatting to the sysop; sounds good, no? The only trouble is, only MSS's own BBS-PC software supports SADIE, so you're fairly unlikely to use it that often. Shame, really – a good idea spoilt by not releasing the details of the protocol into the public domain.

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FEATURE COMPARISON TABLE

	ONLINE! PLATINUM	A-TALK III	JR-COMM 1.02	NCOMM 1.92
Phone book entries	40	60	9999	Infinite
Macro Keys	20	20	40	20
Protocols: XModem	Y	Y	Y	Y
XModem-CRC	Y	Y	Y	Y
WXModem	Y	Y	Y	N
YModem	Y	Y	Y	Y
YModem-Batch	N	N	N	Y
YModem-G	N	Y	Y	Y
ZModem	Y	Y	Y	Y
CIS B	Y	N	N	N
CIS B+	N	N	Y	N
CIS QuickB	Y	N	N	N
Kermit	Y	Y	N	Y
SADIE	Y	N	N	N
XPR library	N	Y	N	Y
Screen: Workbench	N	Y	Y	Y
Custom PAL	Y	N	Y	Y
Overscan	Y	[1]	N	N
Interlace	Y	[1]	N	Y
Max colours	8	8	16	16
Fonts: Large Fonts	Y	Y	N	N
IBM Fonts	Y	Y	Y	Y
Local Fonts	N	N	N	Y
Max Columns	132	132	80	80
Emulation: VT-52	Y	Y	Y	Y
VT-100	Y	Y	Y	Y
VT-102	Y	N	N	N
ANSI	Y	Y	Y	Y

	ONLINE! PLATINUM	A-TALK III	JR-COMM 1.02	NCOMM 1.92
H19	N	Y	N	N
Tek4010	Y	Y	N	N
Tek4014	N	Y	N	N
SkyPix	N	N	Y	N
ASCII: Scrollback	Y	Y	Y	Y
Cut & Paste	Y	Y	N	Y
Capture	Y	Y	Y	Y
Send	Y	Y	Y	Y
Search	N	N	N	Y
Max Baud Rate [2]	57,600	57,600	57,600	115,200
Multi-Serial support	Y	Y	Y	Y
Call Timer	Y	[3]	Y	Y
Logging	N	N	Y	Y
Costing	N	N	Y	[4]
Scripting	Y	Y	N	Y
Host	Y	Y	N	Y
Remote	N	Y	N	N
ARexx	Y	Y	N	N
Price	£40.82	£91.91	US$35	[5]

Notes:

[1] Supported only in Tektronics mode

[2] The standard serial port can only manage 31,250 baud. Higher speeds require 68030 and/or multi-serial board

[3] The timer is manually operated, hence does not give a reliable estimate of call duration

[4] Via an external utility

[5] The authors request a gift of equivalent value to the program

Shopping List

Commercial Packages:

A-Talk III................£91.91 inc VAT
Published by Oxxi Inc,
PO Box 90309,
Long Beach,
CA 90809-0309, USA
☎ 010 1 213 427 1227

Online! Platinum Edition
..............................£40.82 inc VAT

Published by Micro-Systems Software Inc,
12798 Forest Hill Boulevard,
Suite 202,
West Palm Beach,
Florida 33414, USA

Both distributed in the UK by HB Marketing Ltd,
Unit 3, Poyle 14,
Newlands Drive, Colnbrook,
Slough SL3 0DX
☎ 0753 686000

User-Supported Packages

JR-Comm 1.02
........Registration: $35 (appx. £21)

Supported by John P. Radigan, Dynalogic,
PO Box 698, Mays Landing,
NJ 08330, USA
E-mail: jprad@faatcrl.UUCP

NComm 1.92 ....Anything!

Supported by Torkel Lodberg,
Pilotveien 10,
N-0384 Oslo 3, Norway
Email: torkell@ifi.uio.no

Both shareware packages should be available from good BBSs and public domain software houses.

continued from page 121

A small sticker on the box and some notes tucked away in a ReadMe file mention the fact that *Online! Platinum* has ARexx compatibility written into its script language. This allows scripts to control other programs and manipulate data in a very powerful way. You do need to buy ARexx, but the additional flexibility it adds to the program is worth the expense.

Online! Platinum works quickly and reliably, almost to the point of being boringly respectable. It looks like many other pieces of two-year-old Amiga software; old, but still able to give solid service.

JR-COMM 1.02A

JR-Comm is shareware, so the version you will find on the bulletin boards starts complaining if you don't register within 30 days.

JR-Comm excels in its file transfer handling. Indeed, the options for tweaking the Z-Modem protocol alone fill most of a screen. I've never had *JR-Comm* fail on a transfer, except when I had the parameters set incorrectly.

And there lies the problem with the program: the huge number of different, alterable parameters. Too many options are presented at once. I feel dissuaded from using the package since all the gadgets scream out to be used.

If you can handle this, you will find the program rewarding to use. It has a particularly fine emulation of IBM PC ANSI graphics, right down to the emulation of a PC keyboard for those few on-line games that may require such a thing.

JR-Comm is the only package reviewed here which does not have a script language. This is no great issue for most people, since browsing and downloading cannot easily be automated. However, it can sometimes be extremely useful, and the addition of a script language would turn this good package into an extremely fine one.

Obtaining technical support in the UK is somewhat difficult. Mr Radigan, the program's author, patrols the Amiga communications newsgroup on Usenet with great regularity, and answers queries quickly and clearly. Unfortunately, very few comms users in the UK have access to Usenet, except for CIX and Direct Connection subscribers and a few universities. Work on a new version with scripting, ARexx and XPR support is in progress, and these developments may push *JR-Comm* way beyond its competitors – watch this space.

Despite the few problems, the fact that you can try *JR-Comm* for yourself before being committed to any expenditure is a great boon, and the program has thousands of satisfied users the world over.

NCOMM 1.92

NComm poses a problem to its users: how much is a really good piece of software worth? All the authors ask in the way of payment for this software is a gift equal to the perceived value of the package.

NComm can trace its ancestry back to Dan James' *Communicator*, but only the very core code remains. The program was originally written as an attempt to support the Norwegian character set in a usable comms package, but like many software projects it grew way beyond the original aims.

The most useful feature of *NComm* is its internal multitasking. Most other packages don't allow you to type commands into the terminal while a requester is on the screen, but *NComm* does. This allows you to call up a file requester and find a file to transmit before typing the upload command into the remote system. It may seem trivial in explanation, but in use it is indispensable.

NComm uses XPR libraries to handle its more complex file transfer protocols such as Kermit and Z-Modem. This has caused a few problems, since the newest version of the XPR Z-Modem.library is flawed, frequently causing bad transfers, so an older and slower version has to be used until the library is fixed.

Ease of use has been designed into *NComm*. You'll never be confronted with a barrage of options all at once. Except for phonebook and modem configurations, everything can be changed from the menu bar. Thus, only the options you actually need to see are displayed.

Phone charges are high in the UK, and *NComm* can keep a log of all calls made. External utilities estimate your bill and allow voice calls to be added to the log. These utilities are registered (and distributed) separately.

People with extremely fast modems complain of intermittent problems with *NComm*, but my V.22bis machine causes no hassle. There are a lot of new features to *NComm* 1.92; so many that users of *NComm* 1.9 will feel that it's almost a different program. AS

BEST BUY

NComm 1.92
Competent and inexpensive; currently the best of the bunch.

HIGHLY COMMENDED

JR-Comm 1.02
Its complexity and lack of scripting knocked it into second place.

CHECKOUT A-Talk III

Documentation ●●●●●
Some day, all manuals will be written like this. All the program's features are described in minute but readable detail.

Features ●●●●○
Absolutely every terminal emulation you could ever want. Curiously, though, there's no support for PAL displays.

Ease of Use ●●●○○
Installs and works straight from the box, but the huge number of configuration options is daunting

Price Value ●●○○○
Very expensive at £91.91, but offers a complete comms software solution.

Overall rating ●●●○○
A powerful and reliable comms package, with an unfortunately high price tag.

CHECKOUT JR-Comm 1.02

Documentation ●●●●○
Lots of it, and geared towards the expert user. The utterly clueless would probably remain so.

Features ●●●●○
No script language, but just about everything else. Possibly the best Z-Modem implementation anywhere.

Ease of Use ●●●●○
Huge banks of options frighten the timid, yet once installed the program is flexible and fast.

Price Value ●●●●○
Superb – $35. Wonderful technical support – if you have access to Usenet.

Overall rating ●●●●○
Not really for beginners, but the one to go for if you prefer raw usability to cuteness.

CHECKOUT NComm 1.92

Documentation ●●●●○
Slightly iffy English sometimes, but the idea gets through anyway. Full of hints for quicker connections.

Features ●●●●○
Internal multitasking of requesters is truly wonderful. Despite the lack of ARexx scripting, most tasks can still be automated.

Ease of Use ●●●●○
Doesn't sling too many options about at the one time. All the features are well laid out and easy to change.

Price Value ●●●●●
Beautiful; you only contribute what you think it's worth!

Overall rating ●●●●●
An incredibly powerful package which also manages to be easy to use. Should suit the majority of comms users..

CHECKOUT Online!

Documentation ●●●●○
Brief, but good. Explains all that is required to be explained, but little of the deep background info.

Features ●●●●○
Purports to be a BBS user's package, but lacks the vital call costing and logging features. Superb script language, though.

Ease of Use ●●●●○
Apart from a cute but subtly flawed install routine, it does what it should, when it should.

Price Value ●●●●○
£40.82 is as low as is commercially viable, yet it has lots of solid features..

Overall rating ●●●●○
If you require scripting and ARexx interoperability, *Online!*'s the one, despite its dated looks.

Software for free



"Join me on my monthly journey to the public domain, where all software is free – or, at least, extremely cheap."

Phil South

Welcome to the world of public domain software. And before anyone accuses this of being an all-Amiganuts issue, stop it right there. Amiganuts figures large in this and every issue because the company sends a lot of high-quality stuff to me every month, and by and large what's sent in gets reviewed. I've said this before and I'll say it again: I'll review programs I get sent, and if PD houses don't send me any software, I can't review it, can I? I get a lot of stuff from Amiganuts, 17 Bit, Crazy Joes, NBS, New Wave and various others, which is why those people are in almost every issue of *Amiga Shopper*. If you keep me regularly supplied with new stuff as it comes in, then I can report on what's new in the PD market, and you can publicise all your new disks. It's a simple symbiotic relationship, and one you should fairly quickly get the hang of!

Right, that's enough sarcasm, let's hit the reviews.

UTILITIES

Although there isn't much around in the way of utility PD at the moment, what there is is certainly good quality.

MESSYDOS

NBS disk U619

The trackdisk.device on the Amiga is very versatile, and with judicious programming it can be made to read other formats. So with this in mind, you'll be chuffed to hear that MS-DOS disks can be read in your Amiga drives with this program. It's a sort of PD version of the Consultron program *CrossDOS*. When you insert an IBM-type disk in your Amiga, the *MessyDOS* driver is checked from the mountlist in your Devs directory, and Bob's your uncle – you can read and write to the disks as if they were normal Amiga disks. All you need to do is add the following to your mountlist:

```
MS0: FileSystem =                        ↵
   L:MessyFileSystem
   Device = messydisk.device
   Unit = 0
   Flags = 0
   LowCyl = 0 ; HighCyl = 79
   Reserved = 0
   Surfaces = 2
   BlocksPerTrack = 9
   Buffers = 5
   DosType = 1
   BufMemType = 1
   BootPri = 0
   Stacksize = 3072
   Priority = 9
   GlobVec  = -1
   Mount = 1
#
MS1: FileSystem =                        ↵
   L:MessyFileSystem
   Device = messydisk.device
   Unit = 1
   Flags = 0
   LowCyl = 0 ; HighCyl = 79
   Reserved = 0
   Surfaces = 2
   BlocksPerTrack = 9
   Buffers = 5
   DosType = 1
   BufMemType = 1
   BootPri = 0
   Stacksize = 3072
   Priority = 9
   GlobVec  = -1
   Mount = 1
```

Of course if you have a DF2: or DF3: you will need to alter the second entry or add additional entries named MS2: or MS3: etc. Then add the command:

```
mount ms0:
mount ms1:
```

and your Amiga will recognise MS DOS disks.

This is not so much a single utility, but rather a whole subsystem which co-exists with your regular Amiga system, ready to be used at any time.

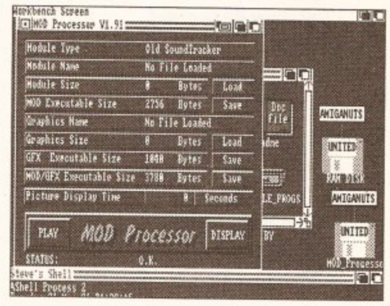
The really neat thing about *MessyDOS* is that the MS-DOS disks can be called like any other Amiga device. So you can load and save IFF pictures to a paint program from a PC disk, as well as text files and so on. This is a top notch utility, and one which all users should have, especially those who also have PCs at home or at work.

Value for money....................8/10

MODULE PROCESSOR 1.91

Amiganuts disk 1068

An update to previous versions, this is a new revision of Steve Marshall's module-to-executable processor. Simply take a module from your favourite music tracker, slip it through *Module Processor*, and you've got a chunk of executable code which can be run just like any other program – very useful for adding music from tracker sources to non-tracker programs.



***Module Processor* makes music files executable.**

Value for money 8/10

continued on page 127

PAYING FOR IT

Be prepared to pay between 99p and about £2.50 per disk from a PD software house. Whether you pay the lower or higher price is entirely up to you. I suppose the variety in prices depends on how the disks are duplicated. If the company has an office and a duping machine, then it costs money to run. But if it's built the PD house into an existing business, then obviously it has no overheads to speak of. Some 99p PD houses are good, others are terrible. The only way to find out for sure is to spend 99p. Or read *Amiga Shopper* every month for the same price, and find out from us!

BEGINNERS START HERE

Software for free? How's that then?

This may sound like a call to piracy, but public domain software is free to anyone. Yes even you sir, you at the back with the Jolly Roger. There isn't any catch, unless you count the fact that there is so much PD software on offer that it's hard to choose what you're going to have. And that's where I come in.

But what does PD mean?

The public domain concept is borrowed from the early days of mainframe systems, where enthusiasts (called 'hackers' then, before the word had less pleasant connotations) produced programs and distributed them to their friends and fellow hackish types, asking for no payment but the glow of being recognised as a truly hackish coder. The copyright was waived by the author, and so the program was said to be in the public domain – that is to say, any member of the public had a right to copy and use the program however they wished, provided that the author's credit and any relevant documentation was distributed with the program.

So how can I get hold of all this wonderful free PD?

Either buy it from a PD library (see the last page of this article for a list) or, if you've got a modem, download it from a bulletin board. These are computers with modems, which anyone can use a phone and modem to log on to, download a lot of demos and utilities, leave a few messages and programs of their own and log off. You'll find that there are many bulletin boards with Amiga files available for download.

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HyperQuick

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UTILITIES

101 TetraCopy - *Good Disk Copier*
102 DCopy → *Excellent Disk Copier*
110 NComm V1.9 → *Hands on Modem disk*
111 JRComm - *Good but complicated*
120 DPaint Fonts (4)
121 DPaint Cartoon Brushes
122 TV Graphics (2) - *Ideal for DPaint*
124 DTP Clip Art (2) - *Ideal for DPaint*
129 Hamlab - *image Converter*
133 Iconmakers - *some good progs.*
141 C-Light → *Darn good Ray Tracing.*
142 Beazier Surf - *More Ray Tracing.*
156 IntroMaker - *Design your own startup*
159 SuperWorkbench v1.5 → *SUUPERB!!*
161 Jazzbench
162 Sid V1.06 → *Essential Dir Utility*
187 MessyDos -*MSDOS on the Amiga*
190 NorthC V1.3 - *C Compiler*
192 'C' Tutorials (4) → *Learn 'C'*
201 NoisePlayer V3
204 Soundtracker V4.0
205 Perfect Sound V1.93
210 Med V.3 → **THE** *best music Creator*
211 Sound Applications (2)
223 QED Text Editor
225 uEdit V2.6 - *Excellent Editor*
229 Spread - *Good. Simple Spreadsheet*
230 Textplus V3.0 → *Superb Wordprocessor*
238 Assassins Multivision
250 SynchroPacker V4.6 - *Good*
301 A-Gene V3.12 → *Family Trees - V.Good*

MUSIC

402 Stop Right Now! *
403 Madonna: Hanky Panky
406 Betty Boo
410 Digital Concert IV - *Not Bad.*
415 Bomb the Bass - *Good*
418 Depeche Mode - *Good Sound*
421 Flash - Queen (2) - *Well done & long*
422 Vangelis *
438 Cave: Synthetic Power - *V.Good.*
440 J.M. Jarre: Definitive - *Good*
445 **Power of Love: Huey Lewis (2)**
447 Crusaders Does Genesis - *Excellent*
451 **The Art of Med** → *long MED Samples.*

Key
* denotes 1 meg reqd.
(x) Figure in brackets denotes the No. of disks in set.

DEMOS/SLIDESHOWS

603 Billy Connoly (2) - *O.K.*
605 Panthorux Megademo (2) *
607 System Violation Demo *
610 Crionics: Total Destruction *
618 Vortex Megademo
619 Evil Dead Demo *
623 **EIVIRO Demo** → *fantastic Game Demo*
630 Ecstacy Demos *
640 **RED SECTOR MEGADEMO** (2) → *SUUPEERB*
644 **SILENTS: BLUE HOUSE**(2) → *Game & Demo*
650 **IRAQ DEMO** → *Extremely Funny*
651 Madonna Cartoon - *Very Short*
670 **BATMAN** → *Very well done anim.*
673 **POGO ANIM** → *(1.5 meg reqd.) V. Good*
674 **AMY V'S WALKER**
701 Comic Slideshow - *V. Funny*
703 TV Sports Basketball
705 Terminator
708 Miller Lite Ad.
709 Viz Slideshow
716 Gorezone Slideshow - *YUK!!*
719 Kylie Minogue (2)
720 Madonna Slideshow
721 Madonna Slideshow (2)* - *Ooh Mrs*

GAMES

7 Tennis *
10 Castle of Doom
15 **Star Trek (3)** → *Two Drives reqd.*
21 **Holy Grail Adv.*** → *Great Text Adv.*
23 Breakout Con. Set
26 Blizzard - *Good Shoot 'em up*
38 Drip - *Very Good*
39 Pipeline - *Impressive*
40 The Jar* - *Darn good*
41 Jeopard *
45 **Star Trek - The Final Frontier (3)**
47 **James Pond & Paradroid**
48 **MegaBall** → *Extremely addictive*
L1 Footie - Licenceware £3.00

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BEGINNERS PACK 4 DISKS £3.96
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B305 Visicalc (Spreadsheet)
B306 U-Edit (Great word processor)
B307 Journal (Good home accounts)
B322 600 Business Letters (All ready to go)
B323 Database Master V2

UTILITIES
U401 Power Packer 2.3B (Superb Cruncher)
U402 Master Virus Killer v2.1 (A must)
U458 Freud (Take the test!)
U404 A-Gene v3.125 (Latest Family Tree)
U405 ST + C64 Emulators + MessyDOS
U406 Jazzbench (upgraded Workbench)
U407 WB2 (Workbench v2.0 lookalike)
U471 X Copy III (The ultimate copier)
U413 Sid v1.6 (makes you a master of CLI)
U438 Spectrum Emulator (9/10 Amiga Shopper)
U465 Antiflicker (eases high-res flicker)
U476 Golf Performance (Record golf stats)
U472 Comms disk (total modem control)
U461 Cryptic utils (inc. Diskmaster)

GAMES
G620 Pipeline (commercial quality)
G659 Turn + Tricky
G632 Tennis
G602 Megaball (The best breakout game)
G673 Trucken (Run your own company - 2 disks)
G672 Air Warrior (Good flight sim)
G607 T. Richter Star Trek (2 disks)
G641 Star Trek (3 disks)
G624 Blizzard (Superb shoot-em-up)
G671 Mental Images (9/10 3 great games)
G651 Eat Mine
G652 Dynamite Dick
G670 Zeus (Very addictive)
G663 Sealance (great sub simulator)
G662 Boing the Game (2)
G655 Crossword Creator
G660 Wordsquare Solver
G668 Fruit Machine
G674 Wizzys' Quest

CHILDRENS
C701 Learn + Play (2 disks)
C702 Train Set
C703 Talking Colouring Book
C704 Simon Says/Space Maths
C705 Treasure Island
C706 Snakes + Ladders
C707 Pair It (Play it with the kids!)
C708 Cross Fire (Fun & addictive)
C709 Pixie Kingdom (2 disks)
C711 Wacko in Wonderland (Like Dizzy!)

GRAPHICS
GR801 C-Light (Ray trace)
GR802 DKB Trace (Ray trace)
GR803 Slide Show Construction Kit
GR819 Amos Paint (v. good paint prog.)
GR805 Mandelbrot Generator v1.85
GR821 Spectrapaint (serious DPaint rival)
GR807 Graphics Utilities Disk
GR828 Hamlab (Great Picture Processor)

MUSIC
M901 Med v3.0
M902 Sound Tracker Pro
M903 14 Sample disks for above
M919 Kefrens Jukebox
M920 Future Composer

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continued from page 124

INTUIMENU V2.0

Amiganuts disk 1075

This is an Intuition-based menu program which allows you to run any program from the Workbench, even programs which have no icons. This is an available process on Workbench 2.0 machines, of course, but 1.3 users have no recourse but to use the CLI. This system allows you to set up a special customised menu, and is a lot like the program selector program used by many disk magazines written by Nico Francois. *IntuiMenu* was written by Nick Lewis, and the system runs as a normal Workbench window, using all the normal gadgets and fitting in with any other programs you might be running.

Value for money 6/10

MASTER VIRUS KILLER 2.2

Amiganuts

A stonking new version of one of the most powerful virus hunter/killers on the market. Over 150 viruses are recognised, and the program also includes link virus, bootblock and even disk validator virus checker/killers. This is still the best quality, most up-to-date virus checker you can buy, and I strongly recommend that you get a copy.

Value for money 10/10

APPLICATIONS

'Applications' is becoming such a loose term these days. I tend to think that an application program is anything you can use as a tool, for whatever purpose – traditional or original. The apps on show this month fall into both categories.

WORDS V2.0

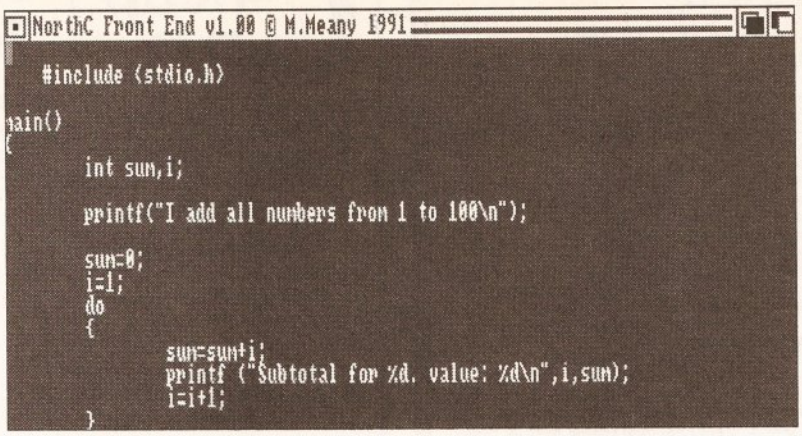
Amiganuts disk 1073

Words is a word-finding utility for puzzle players, written by Mark Meany especially for Amiganuts. The shareware version is limited to a mere 10,000 words, and the full version costs just £5.

The program can find anagrams of a given word, make words from a given word, and guess at a word of which only a few letters are known. The applications of such a program are obvious, in the fields of crosswords and puzzle solving. Not only can you solve crosswords but obviously you can create them too, as you can input the letters you have to play with and let the program find a matching word.

All the functions of the program are activated by pushing on-screen buttons with the mouse. Just type in the word you want to trap for, and off the program goes, searching its database until it finds a match. An unusual program for sure, but a very well put together and original one.

Value for money....................7/10



A new front-end makes *NorthC* far easier to use.

PCQ PASCAL

Amiganuts disk 1113

NORTHC

Amiganuts disk 1112

Both these disks are the regular PD C and Pascal compilers you know and love, but with an identical front-end and text editor program bolted on the front. The front end part of the programs was written by ACC editor Mark Meany, and a fine job it is too. Now you can compile and link your programs with the minimum of fuss, and even type them in using a pretty good editor too. The editor features clear, load and save, insert file, print, find, find next, find previous, go to lines, top, bottom, compile and run. A basic editor to be sure, but not a bad environment to write and run your C and Pascal programs.

Value for money....................9/10

ACC ASSEMBLER V1.0

Amiganuts

An assembler package using the Mark Meany front-end text editor, and tying together the *A68K* PD assembler program with the *Blink* linker program. An excellent companion to the *Amiganuts Coders Club* disks (see later), as you can then whip source code off the disk, compile it, run it, change it, compile it again and so on. The amazing thing about this assembler is that it works without any tinkering and messing about. I compiled one of the example programs – and there are a lot of them – and it ran straight away. With Shell-free operation, this represents one of the easiest and cheapest ways into 68000 assembly language.

Value for money....................9/10

MUSIC

The music demo field has become a little thin on the ground lately. All the 'music only' teams (Crionics are a prime example) have found graphics and coding people and branched out into fully-fledged demo teams. But there are still music demos out there; here are the cream of the current crop.

FOUR SEASONS

Amiganuts 1080 (two disks)

The 'value for money' rating for this will vary, depending on how well you know (and like) the original music by Vivaldi. If classical music leaves you cold, however, I'd still not pass this up, as the classics played on synths are often more accessable to the untrained or disinterested ear. That's just my opinion, and you may of course disagree. But for PD prices you can always reformat the disk!

Value for money....................6/10

MED V3.11B

Amiganuts

A new version of the popular *MED* tracker program. This version has all the reported bugs fixed, and also features some new samples and synthesised sounds for your library. *MED* is by far the most versatile tracker in the business, and this new version is as close to perfect as it can get. Please support *MED*, since it is a commercial quality product being sold as licenseware, and we need more of this sort of thing. It also features some demo tunes for you to play with.

Value for money....................9/10

GRAPHICS

There are very few slideshows around at present, although to be honest I'm not sure that they are a good thing anyway, breeding laziness on the behalf of the producers. Most great slide artists are now with demo crews, so you'll find some of the finest still art in megademos rather than on slide shows.

SPRITE DESIGNER V1.01

Amiganuts 1102

This is a ho-hum animated sprite designer from Artwerx, good for making blocks for the *Screen Designer* (another Artwerx program). The program handles 4-colour or 16-colour sprites in medium resolution, and that's about it. If you want a more flexible program than that, then you'll have to look elsewhere.

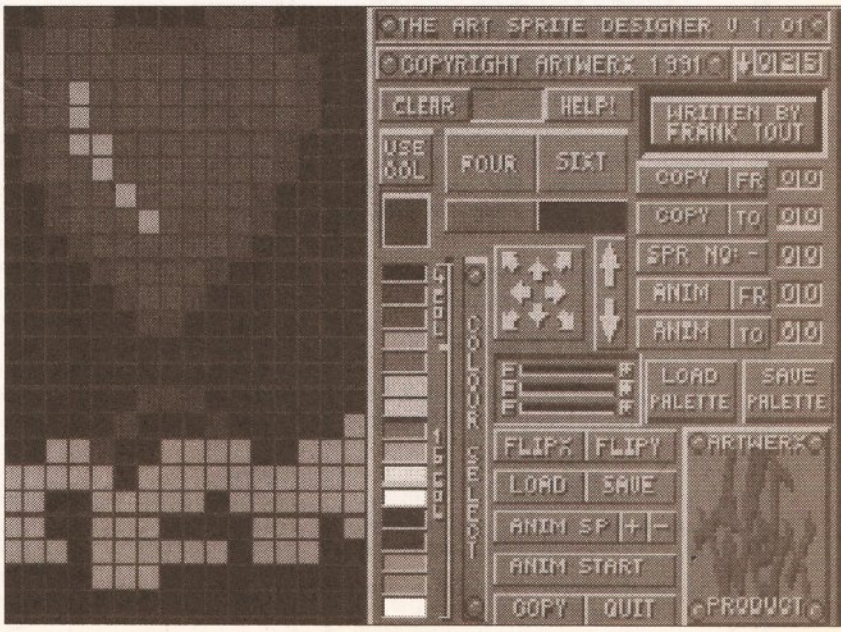
Value for money....................4/10

HAMSHARP AND AMIGIF

Amiganuts 791

These two programs transfer GIF to HAM pictures, and back again. *HAMSharp* allows you to view GIF format pictures in HAM mode for maximum effect. GIF is the CompuServe standard graphics file type, and viewers for a range of computers abound. *AmiGIF* is an Amiga IFF to GIF converter so it's the other way around to *HAMSharp*. Both programs support resolutions of 320 x 200 and 320 x 400 in up to 32 colours or HAM mode, and 640 x

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Sprite Designer 1.01 – "A ho-hum animated sprite designer."

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200 and 640 x 400 in up to 16 colours. HAM mode pictures are reduced to 256 colours. This is an early version of this program, and after this time I don't really see it changing much, except to fix bugs.

AmiGIF is basically the same idea and design as *IFF2GIF*, by Steve Wilhite (and uses the modules COMPRESS.C and BUILDGIF.C from that program), but unlike that previous program *AmiGIF* will process HAM pictures as well. It might also be a bit faster processing non-HAM pictures.

AmiGIF requires a significant amount of memory to run: roughly 200-300K, depending on resolution. It can also eat over 512K for pictures in high-res interlaced mode (640 x 400). It's a slightly flakier program than *HAMSharp*, but it works. For really top quality, though, you can't buy better than *Art Department Professional*.

Value for money 5/10



The Wall **is an enormous – and superb – demo from Split Dimension.**

DISK MAGS

Disk mags are popping up like mushrooms all over the place, and the quality gets better and better with each new release.

CODERS CLUB

AMIGANUTS DISK ACC 14

The coders club is a programming disk magazine, containing source and executable code for programmers of all levels of experience. The club magazine is always jam-packed with technical goodies, and the editor Mark Meany is known for his many interesting contributions to the main Amiganuts library, some of which I've looked at elsewhere this month.

Among the contributions to issue 14 are articles on how to do area fills, fractals, RAW graphics file slideshows, multiload graphics, a *Noisetracker* VU meter, and various demo techniques, plus all the usual letters, source code, executables and tutorials which make this magazine such a concetrated coding experience.

Value for money 8/10

TBAG ISSUE 55 AND 56

Amiganuts

The Tampa Bay Amiga Group is famous for its disks of Amiga PD, and not least for the superb presentation. The disks are brimming with interesting, and frequently brand-new, programs. Issues 55 and 56 are recent additions to the TBag list; disk 55 contains the screen hacks *AmigaPet* and *Nightmare*, the utils *Typing Tutor Zoom* and *Super Duper Backup*, the games *Amigatration* and *Up&Down* and a graphic called *Vibra*. My favourite program is *DriveIFF*, which allows you to 'drive' over the IFF file of your choice. For high quality PD in a magazine format, you can't really beat *TBag*.

Value for money....................9/10

DEMOS

There are a number very big demos out at the moment, and I'm looking at some of the biggest this month. If anyone was in any doubt that Amiga demos are a new artform, this should convince them once and for all. A six-disk demo with a running time of more than 20 minutes isn't a computer demo, it's practically a music video.

THE WALL DEMO

Amiganuts 1027 (six disks)

This is the biggest demo I've ever seen, and it's all based around *The Wall* by Pink Floyd. Not so much a megademo as a gigademo. The demo was created by Spilt Dimension, and the different sections work together flawlessly, with constant surprises around every bend. To mask the sometimes longish loading times, the team has put colour images and music samples in the gaps to introduce the next section. A clever ruse, and one which works very well. Each new data disk can be inserted when you see a white dot in the corner of the screen, for full and smooth running, but there is a special 'insert disk' demo if you forget to do so. The demo runs on a 1Mb Amiga, so although it has six disks the sections all fit into the computer one at a time.

Some technical info: the demo contains 330K of code, 8Mb of graphics data, 4Mb of sound and music data, and took around nine months to finish. The music was coded using *Noisetracker* and played back using a special customised player routine to allow for nice smooth fades. Some of the wipes use a technique which divides the screen up into 5,104 squares, and turns them off randomly and very rapidly using the blitter! The team used DigiView Gold to grab the digitised pictures from the video of the film, and the sound for the music and effects was digitised using Audio Master 2 at a rate of 20kHz. Some of the stark scenery was created using the PD program *Scenery* by Brett Casebolt. The 3D objects all get darker as they get further away, a technique that the programmers call 'depth cueing'. Most of the individual sections of the demo are around 650-700K uncompressed, which is a fairly large chunk of stuff in anyone's language.

Split Dimension is a new English coding crew, and comprises Elecra on coding and graphics, Vogad on music and graphics and CalTech on ideas, graphics and music. If this is a sample of what Split Dimension can do, I look forward to seeing its next opus which, based on present performance, should be with us in about another nine months!

Value for money..................10/10

LANDING DEMO

Amiganuts 1103 (four disks)

This demo is a massive 5Mb animation from Tobias Richter, and it comes archived on four disks. 8Mb is really necessary to provide the headroom needed for smooth animation.

This animated film was made using the *Reflektions* ray racing software by Markt and Technik, the same program Tobias uses for his other *Star Trek*-style pictures. This is another Amiga animation demo which shows what is possible, and falls more into the category of audiovisual entertainment than being a mere demo. Tobias is one of the premier Amiga artists, and this is one of his biggest and best demos.

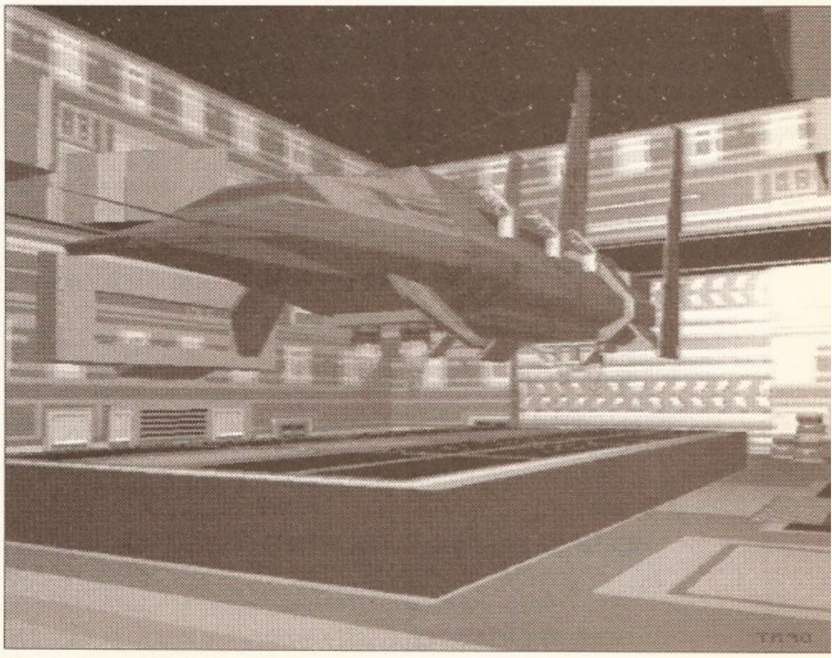
Value for money..................10/10

TOTAL DESTRUCTION

Crazy Joe's disk 1650

The Crionics team is one of my all-time favourites, and this is one of the most exciting demos for a long time. Lots of original copper effects, followed by some very well-done strobe cycle effects. A Crionics demo

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Landing Demo **is a 5Mb opus from Amiga artist Tobias Richter.**

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is always an event, and this one is no exception. Worth the asking price for the heavy metal version of *The Birdy Song* at the end, if nothing else!

Value for money 7/10

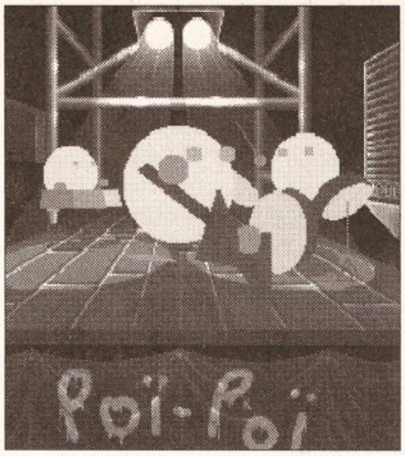
ICE

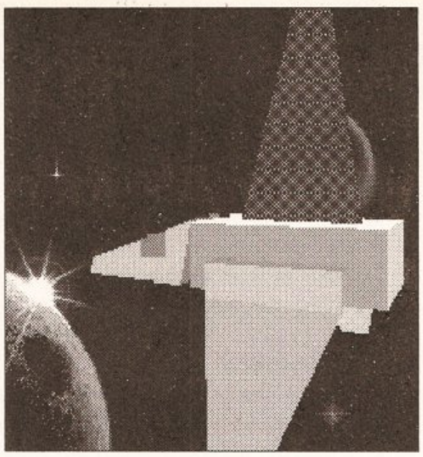
NBS disk D296

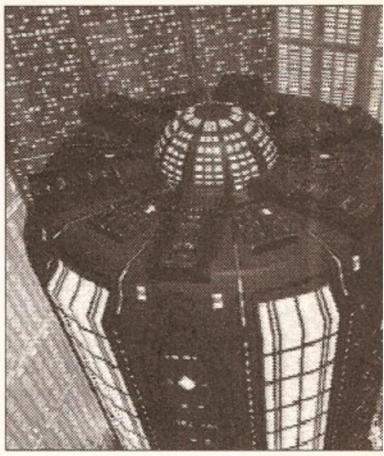
In the same way that a Crionics demo is always going to be worth looking at, a Silents demo is always worth having. As well as showing off the machine, the team has a style and additctive quality all its own. I can see owners of this demo putting it on in the same way as you play your favourite video or CD over and over just to enjoy it.

The coding for this mesmerising new work is by Ronan and Performer, the splendid graphics are by Walt (some of the best I've seen for ages), and the music is by Audiomonster. Vector objects are by Rookie and Ronan, although they are all fairly standard objects, mostly ones made popular by the Elite game from Rainbird. Having said that, there are some ways of using vectors in this demo that are beyond belief. Some very exotic effects here, some huge and very fast vectors, although my particular favourite effects are the enchanting starburst fireworks, which look like a sphere of expanding white dots. There are also some very good jokes, especially if you remember seeing the demos on which the jokes are based. Good value for money, and confirmation that Silents is still up there with the greats.

Value for money....................9/10







***Virtual World* is a very impressive 3D vector demo from Tomsoft, in the form of a journey to a distant galaxy.**

VIRTUAL WORLD

NBS disk D295

Tomsoft has come up with a very impressive 3D vector demo, rivalling the best work of real 3D masters like The Assembly Line. The demo contains 3D spheres and other round objects, allowing for really original objects like 3D versions of the Poi-Pois. But the really impressive part of the demo is the story of an exploration to the far side of the galaxy using a mixture of sparkling IFF graphics and vector objects.

This is one of the cleverest narrative formats I've seen, and with extremely fast animation, too. The 400K of compacted IFF graphics are by Elmer and the very strong orchestral soundtrack is by Audiomonster, who provided all of the 200K of music on the disk. The programming was by Thomas Landsburg, with objects and animation by C-Dryk and Skrew. Additional coding was in the form of a text rendering routine (a very nice metal effect it is too), and that was credited to Performer of Silents. Come to think of it, I have seen that effect before in a Silents demo. A great demo, and very good value.

Value for money....................9/10

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UK PD HOUSES

Amiga Mouse PD
182A High Street
Margate
Kent
☎ 0843 228166

Amiganuts United
169 Dale Valley Road, Hollybrook,
Southampton SQ1 6QX
☎ 0703 785680

Akore Shareware
7 Fishergate Point, Lwr Parliament Street
Nottingham NG1 1GD
☎ 0800 252221

AMOS PD Library
25 Park Road, Wigan WN6 7AA
☎ 0942 495261

Anglia PDL
115 Ranelagh
Felixtowe, Suffolk IP11 7HU
☎ 0394 283494

Blitterchips
Cliffe House, Primrose Street
Keighley BD21 4NN
☎ 0535 667469

CanDo PD Library
128 Portland Crescent
Stanmore, Middlesex HA7 1NA
☎ 081-204-3954

CeN Computers
354 High Street
Chatham
Kent ME4 4NP
☎ 0634 831870

CLS
PO Box 7, Bletchley
Milton Keynes MK2 3YL
☎ 0908 640763

Comp-U-Save
PO Box 157, Hayes, Middlesex UB3 4SR

Crazy Joe's
145 Effingham Street, Rotherham
South Yorks S65 1BL
☎ 0709 829286

Digital Applications
118 Middle Crockerford
Basildon, Essex SS16 4JA
☎ 0268 553963

Edlib
Scotland Farm, Stockwood Road
Brislington, Bristol BS4 5LU
☎ 0272 723489

Electriclown
90 Notley Road, Lowestoft
Suffolk NR33 0OG
☎ 0502 566752

EMPDL
54 Watnall Road, Hucknall
Nottingham NG15 7LE
☎ 0602 630071

Goldstar Computers
PO Box 2, Tyldesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO Box 1309, London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road, Newquay, Cornwall

NBS
132 Gunville Road
Newport
Isle Of Wight PO30 5LH
☎ 0983 529594

New Wave Software
PO Box 199
Manchester M1 1JE
☎ 061-839 5378

PAS Amiga PD Club
3 St John's Walk
St Ives,
Cornwall TR26 2JJ

PCS International PD
Freepost WN5157F
Hindley, Wigan
Lancs WN2 3BR
☎ 0942 521577

PD Direct
Dept ASH, Unit 3
Railway Ent Centre
Shelton, Stoke ST4 7SH
☎ 0782 281506

PD Soft
1 Bryant Avenue
Southend-On-Sea
Essex SS1 2YD
☎ 0702 612259

Postal PD
77A Nottingham Road
Eastwood
Notts NG16 3AJ
☎ 0773 531991

Public Dominator
PO Box 801
Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst
Reading, Berkshire RG3 5AN
☎ 0734 452416

Sector 16
160 Hollow Way
Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO Box 97, Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Softville
Unit 5, Stratfield Park
Elettra Avenue, Waterlooville
Hants PO7 7XN
☎ 0705 266509

Start Computer Systems
Barbican House, Bonnersfield
Sunderland SR6 0AA
☎ 091-564 1400

Vally PD
PO Box 15
Peterlee
Co. Durham SR8 1NZ
☎ 091-587 1195

Virus Free PD
23 Elborough Road
Moredon
Swindon
Wilts SN2 2LS
☎ 0793 512321

West Midlands PD
33 Springhill Rise
Wribbenhall
Bewdley, Works DY12 1EA
☎ 0229 402747/400490

Workbench PD
1 Buccluech Street
Barrow-In-Furness
Cumbria LA14 1SR
☎ 0229 870000

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GAMES

The quality of public domain games has quadrupled over just the last year; here is just one example.

LLAMATRON

Most PD libraries

This is a rare breed, something new in PD. Jeff Minter has been one of the finest game designers and coders in the commercial arena for many years. Now he's released a game into the public domain. Why? Because he is fed up with the commercial world, with its licensed games, unoriginal gameplays and high finance.

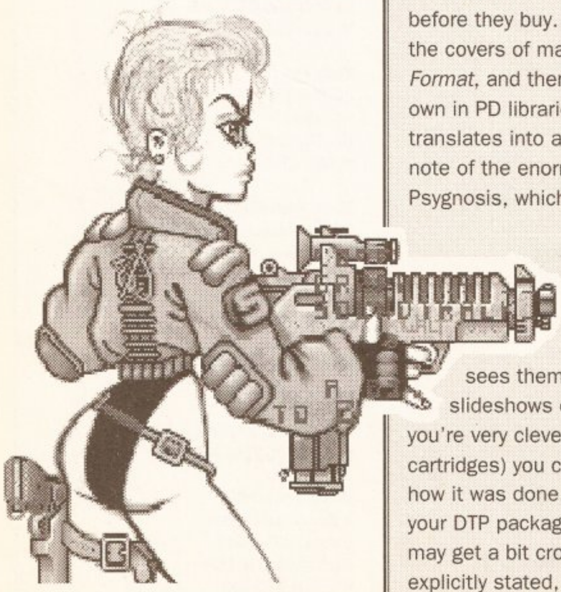
Llamatron is based on the old Williams arcade machine *Robotron*, and it's the usual arcade thrills populated by llamas, goats and sheep. The deal is that you send Jeff £5.00 and he sends you a newsletter, a new game called *Super Grid Runner*, and a poster of a llama. It's a brilliant deal, especially when you play the game and get completely hooked. It's well worth the shareware fee, and almost everyone I know who has a copy not only plays it all the time, but also paid up their fiver to Jeff Minter too! Can't be bad. Ultra-high value for money.

Value for money 10/10

GOODNIGHT

If you have any questions about PD, or some viewpoint you might like to share with me, then why not drop me line at PD, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Or e-mail me on CIX (snouty@cix.compulink.co.uk), Prestel (219997854), Telecom Gold (74:mik2077) or The Direct Connection (uad1135@dircon.uucp).

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One of the characters from a Silents demo.

WHAT'S AVAILABLE?

Utilities

These are programs which help you use your computer. Some are just simple commands for your C directory for use from the CLI or Shell, while others are complete menu-driven programs to compress files, convert them from one format to another or even rescue broken disks. The best disks to look for are the collections with a selection of the best utils all squeezed on to one disk.

Applications

Some of the best programs are PD. *SID*, for example, is one of the best graphic interfaces for AmigaDOS, and it's PD (or, to be more precise, 'shareware'). *SID* is a graphic front end for the AmigaDOS file system, allowing you to move files around, delete them, rename them, copy them and re-organise your disks. In fact, I don't know a single Amigahead who would be without their copy of the program. And there are many other kinds of programs too, from business to graphics applications. Check the PD libraries before you lash out some cash on a commercial program – you may find a public domain solution which could save you pounds.

Demos

This is a new art form. The demos are created by a team of hackers, usually called a 'crew' or 'team', who get together and have a 'late night hack attack' and create a dazzling demonstration of their programming abilities. The demos can be graphics- or music-based, but they always have the feel of a pop video, and the music is generally of the dance variety, although some more exotic sonix do come out from time to time. Demo teams usually go on to be professional programmers after a while, so their demo days are usually limited. Scoopex and Silents are two of the best teams, and also the likes of Kefrens are not to be missed. Imagine a cross between a dance record, a video and a lightshow and you're getting the general idea.

Game demos

In recent years, the various major software houses have watched the PD arena growing and have noticed that lots of people buy demo disks. So they put out demos of their new releases, allowing the punters to try the game before they buy. Demos of this kind usually turn up on the covers of magazines like our sister publication *Amiga Format*, and then before long the demos turn up on their own in PD libraries. A successful and popular demo translates into a very popular game – for example, take note of the enormous success of *Lemmings*, from Psygnosis, which started life as just such a demo.

Slideshows

Some Amiga artists spend a lot of time creating works of art on their computers, which is no good if nobody sees them. So many Amiga artists make slideshows of their work for public consumption. If you're very clever (or own one of the fab new snapshot cartridges) you can grab the art and examine it to see how it was done, and you could even use it as clip art in your DTP packages. (Beware, though, some PD artists may get a bit cross if you do. Remember that unless explicitly stated, copyright remains with the artist, which means that you can't reproduce the work without their permission.) Some of the most stunning Amiga art comes from a chap called Tobias Richter, an artist who lives in Germany. He uses a ray-tracer called *Reflections* (coming soon to the UK), and turns out some amazing stills and animations based on *Star Trek* and other sci-fi subjects. Watch out for him under the name Agatron.

Music Demos

Some PD authors are music nuts, who spend their lives churning out disks of tunes for you to play on your Amiga. Some are *Soundtracker*- or *Noisetracker*-sampled tunes from the charts, re-mixed in the Amiga. Others are synthesized tunes from the classics. Most are pretty good. If you like well-sequenced music, I think you'll be surprised at the very high quality of the tunes around on the Amiga PD circuit.

Disk magazines

Magazines on disk are not new, but there are more now than ever before. *Newsflash*, *17 Bit Update*, *Computer Lynx*, *Scanner* and *Jumpdisk* are prime examples of the type of thing I'm talking about and they are, on the whole, very good. Magazines of this type usually contain PD software, demos and music, plus a lot of graphics and text as well. The text is normally reviews of software and hardware, and is usually quite short to keep the amount of different text files up and leave space for programs too. The text is sometimes a bit on the ropey side, but that's what you get for having a writer who's an editor too. A spelling checker wouldn't hurt some of these guys, I can tell you. Not, of course, unless you hit them with the disk!

PD categories

There is some PD which is not free to all. This is:

1 Licenseware

These are programs which are licensed to specific PD houses, to prevent the free distribution of the program – although the price to the consumer is more or less the same. *MED* is a good example; it's a music program which is licensed to Amiganuts United. This program is sold by Amiganuts, and a proportion of the fee goes back to the author in Finland. This scheme works better than shareware (see below) from the authors' point of view, as the money is handed over when the disk is purchased, rather than trusting the users to pay up later.

2 Shareware

This is a branch of PD that you pay for, but are allowed to use free for a short time first to see if you like it. It isn't expensive, as the author usually only asks for between £5 and £25 for his or her efforts. In most cases it's worth paying in the end, as you get free upgrades and documentation.

There are lots of 'ware'-type schemes. Freeware is usually the name given to normal PD. Beerware was one idea where the fee for using the program was to send the author some beer. Exclusiveware is a new idea, which works a lot like licenseware. Others, like Charityware – if you keep the program you are requested to donate a sum of money to a charity – are reasonably easy to work out from their descriptions.

MEGA BLITZ!

THE ONE STOP SHOP FOR AMIGA PD SOFTWARE

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UTILITIES

PDU 10 Word Processing+Databasing
PDU 16 Air Tunnel Simulation
PDU 31 Fish#143 RIM Database
PDU 32 Fish#144 Analytic spreadsheet
PDU 43 Fish#203 Assembler & C eg
PDU 44 Fish#215 Mandelvroom V2.0
PDU 45 Fish#210 Scientific calculator
PDU 46 Fish#213 Icons(300 in 8 colors)
PDU 51 Fish#219 Astronomy program
PDU 52 Fish#52 A-Z Text Editor
PDU 60 Fish# 237 CLIprint
PDU 70 Fish 193 Keymap Editor
PDU 72 SID V1.06 The ultimate disk util.
PDU 80 Fonts and Surfaces
PDU 81 Disksalve 1.3
PDU 98 Celtics Demomaker
PDU 99 Ham Radio utils(5 disks)
PDU 101 Menu-Maker
PDU 102 Label designer
PDU 103 Icon-Maker
PDU 104 Icon-Mania
PDU 105 Crossword Creator
PDU 118 Various CLI utils
PDU 149 Icon Fun
PDU 151 Fixdisk-disk repairer
PDU 164 Games Music Creator
PDU 168 Vaccine-Booster(Virus killer)
PDU 169 QuickBase-Database
PDU 185 ANC22 (Excellent utils)
PDU 186 Falcon Bootblock Creator
PDU 194 Pman Virus Killer
PDU 200 Virus Killer Pro V2.0
PDU 207 Perfect Sound V1.93
PDU 257 Fish#349 MED V 3.00
PDU 262 MED Modules
PDU 318 Red sector demo maker
PDU 349 Master virus killer V 2.1
PDU 358 Tetracopy

DEMOS

PDD 1 Anarchy Demo
PDD 4 Deathstar Megademo(2 disks)
PDD 7 Elvira Demo
PDD 14 RAF Megademo(2 disks)
PDD 16 Robocop Demo
PDD 20 SAE Demo#25
PDD 21 SAE Demo#32
PDD 31 Anarchy"Ooh its obscene III"
PDD 51 Hacktrick#1 Arsewipe
PDD 52 Hacktrick#2Smashing day out
PDD 55 Kefrens Megademo 8(2 disks)
PDD 62 Northstar Megademo#2
PDD 70 Rebels Megademo
PDD 72 Red Sector Demodisk#4
PDD 73 SAE Demos#23
PDD 74 SAE Demos#36
PDD 75 Scoopex Demos
PDD 76 Scoopex Megademo
PDD 91 Trilogy Megademo#1
PDD 94 Vortex Megademo
PDD 96 Magnetic Fields Demo#36
PDD 97 Predators Megademo(2 disks)
PDD 107 Budbrain I (2 disks)
PDD 115 Magnetic Fields Demo#40
PDD 116 Magnetic Fields Demo#41
PDD 130 Chubby Brown
PDD 131 Crionics Demo
PDD 132 Giants Megademo(2 disks)
PDD 134 Magnetic Fields Demo#45
PDD 145 SAE Demo#31
PDD 152 Flash"No Brain No Pain"(2)
PDD 153 Billy Connally Demo(2 disks)
PDD 160 Hacktrick"Rave-on"
PDD 177 Budbrain II
PDD 179 Crionics Total Destruction
PDD 186 Flash Demos#2
PPD 209 Rutger Demodisk
PDD 212 Space Pack#32

ANIMATION

PDA 9 Knight Animation(1 meg)
PDA 12 Agatron Star Trek Anims 2
PDA 13 Agatron Star Trek Anims 17
PDA 14 Puggs in Space
PDA 18 Miller Lite Advert
PDA 31 Nude Girls Anim
PDA 34 Basketball Anim
PDA 35 BFPO Slideshow(18+)
PDA 36 BFPO Slideshow#2(18+)
PDA 41 Digiviewer Slideshow
PDA 42 Dragons Lair Demo
PDA 45 Monocycle & Sportscar(1 meg)
PDA 47 Holsten Pils Advert
PDA 49 Mayfair Vol.23 no3(18+)
PDA 50 Mega Clean Show V1.7
PDA 54 NASA Graphics
PDA 56 Newtek Demoreel1(2)(1meg)
PDA 57 Newtek Demoreel3(2)(1meg)
PDA 56 Newtek Demoreel1(2)(1meg)
PDA 57 Newtek Demoreel3(2)(1meg)
PDA 58 Paradise Slideshow
PDA 61 Sabrina
PDA 63 Space Anims(1 meg)
PDA 65 Star Trek Anims
PDA 68 Walker Demo1 (1 meg)
PDA 69 Walker Demo1 (2meg,2disks)
PDA 70 Walker Demo2(1 meg)
PDA 73 Westcoast Cracker#4(18+)
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continued from page 132

PUBLIC DOMAIN ON CIX

I thought it would be nice to give you a sample of the kind of talk that goes on in the PD topic of the 'amigashopper' conference on the CIX online service. It's particularly hot stuff at the moment, as there is a fervent row going on about the price of PD. Some CIXen said that the price was fair, some said it wasn't. What's your view? Perhaps some PD houses might like to log on and answer for themselves? Anyway, enjoy this loose chat, all presented with the usual wacky CIX sense of fun, and the best possible taste to boot. Obviously I've re-edited the stream a little to make it flow a bit better, but in spite of all my chopping this is the real flavour of CIX.

Oh yes, and we already have a standing arrangement in the 'letters' topic of our conference. Anyone who wants to save a stamp (and pay Telecom instead) can send e-mail to us there and have their electronic musings merged into the letters pages of the magazine.

If you'd like to use CIX and you have a modem and a credit card, call up on 081-390 1244, with 8 data bits, no parity and 1 stop bit on your terminal software, 24-hours a day.

==========================

amigashopper/pd #36, from paulo
This is a comment to message 35.

It says in the box at the back of *Amiga Shopper* that you have 'cast iron editorial independance', so let's face it. If ICPUG can do it for free, why are these PD guys charging £2.50 a disk? They're obviously running a business, thus they are making money, and thus they are breaking all the rules of PD.

==========================

amigashopper/pd #38, from pmiles
This is a comment to message 36.

ICPUG does do the copying for free but to members only who, in the first place have to join the club for £16. However, after that painless exercise then the disks are free but the member has to pay for the postage packing.

==========================

amigashopper/pd #39, from miketodd
This is a comment to message 36.

Paul, while I agree with you in principle, ICPUG does not do it for free. Well, not strictly. You supply the disk and P&P, and a volunteer will do the copying when he/she has time and you are limited in the number if disks you can have at any one time.

==========================

amigashopper/pd #40, from jwalker
This is a comment to message 37.

And then there's the advertising costs. Then there's the initial cost of stocking perhaps 1,000 PD disks, most of which they had to pay £1-2 for in the first place themsleves. Even a small stand at a computer show costs close to £1,000. They don't have to be at the show, but the crowds around PD stands prove that the punters want them to be there.

==========================

amigashopper/pd #41, from pcartwright
This is a comment to message 40.

I agree with every word of that, Jeff. I have never understood the beef against PD Houses covering rent, advertising, staff, lighting etc. by putting a bit on the top. Like any service, one has to pay for it.

==========================

amigashopper/pd #42, from miketodd
This is a comment to message 41.

But the question is not so much is it right to allow them to make a profit (and cover costs), but is it right to allow them to make a profit out of other people's copyright works? Many pieces of software actually state that it is freely distribtable provided that no more than a nominal charge is made or that no profit is made in the distribution.

==========================

amigashopper/pd #44, from snouty
This is a comment to message 39.

The main reason I can see is that these guys have paid out n,000 quid on a disk duplicating machine, and they pass this cost on to the customer. There are some PD folk who sell mostly 'licenseware', where a proportion of the cost is sent to the author, which I do agree with.

==========================

amigashopper/pd #48, from paulo

No one said PD software has to be free. What is true, though, is that no profit should be made from the sale of PD software. People making their living from the sale of other people's PD software is wrong. Those who have written the software have done so in their own time and without profit, and they have also requested that those who distribute the software do the same.

==========================

amigashopper/pd #77, from mat
This is a comment to message 36.

I don't think they are breaking the rules of PD – if it is PD you can do whatever you like with it, sell it for 200 pounds, there is no restriction. If it is shareware then it is a different matter but most shareware authors don't mind people covering their costs; anything to get their software in the hands of as many people as possible, more chance of the thing being registered.

==========================

amigashopper/pd #80, from kevinhall

Ok, enough of PD on disk. The entire Fred Fish collection is now on one CD ROM disc for 30 quid. Once the collection has been laid out and a CD master has been made, perhaps someone could tell me just where the 30 quid is supposed to go? CD duplication is fairly cheap. OK so they argue that to buy all 400 disks worth would cost a fortune, so what? You're not buying the software but the media it's on. There can be no excuse for this price. And anyone that argues there is, is more than welcome to buy all their future CD music purchases off me for the equally reasonable sum of 30 quid!

==========================

amigashopper/pd #81, from tricky
This is a comment to message 80.

I believe that once you've made the master, CDs cost 1-2 quid each for the first 1,000 disks to be pressed. Obviously time is going to have to be spent mastering and compiling. The company doing it may make a lot of money out of it, but there's no disputing that it saves the individual money, time, and storage space, and is also very convenient!

==========================

amigashopper/pd #90, from tricky, 221 chars, Jul 18 01:18 91

What we need to do is to slap together a CD-ROM containing the most popular PD/FD/shareware, and arrange with *Amiga Shopper* to carry it as a coverdisk. Remove the largest demand and watch the profiteers fade and die.

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- Don't forget to keep your receipt.

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- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
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BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

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Word processors are the single most commonly-used type of software. Anyone with a printer needs a word processor, and it is important to get a good one, as you will be spending a great deal of time using it. In this month's competition *Amiga Shopper*, in conjuction with Gordon Harwood Computers, is pleased to offer 20 of our readers each a copy of the acclaimed *Pen Pal* word processor, worth £80.

Pen Pal is a sophisticated graphical word processor. You can import IFF images (even in HAM mode) and run text around the graphic – verging on DTP. *Pen Pal* comes with its own built-in database; using it you can store all your commonly used names and addresses, then use the mail merge feature to produce personalised copies of letters. And as you would expect from a professional-quality word processor, you can have several documents open at once and cut-and-paste between them. The package even includes a spelling checker with a dictionary of over 100,000 words.

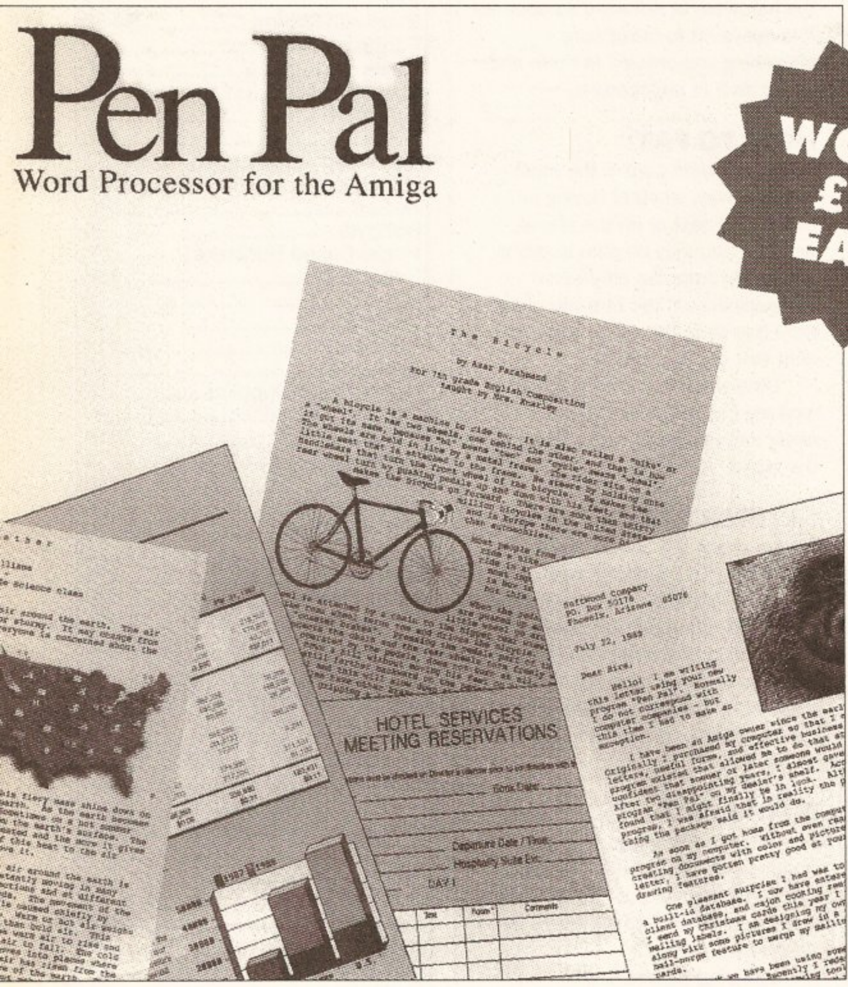
Many have been impressed by *Pen Pal*, including our sister magazine *Amiga Format*, which concluded: "*Pen Pal* is very special. It deserves to do well".

Now you have the chance to find out for yourself. All you have to do is read the questions below, then fill in the tear-off card bound in to this issue between pages 106 and 107, stick a stamp on it and send it back to us by October 3.

And now for the small print (which isn't any smaller). As ever, the editor's decision is final and no correspondence will be entered into. Entries must be on the official card – no photocopies are allowed. But then, it's not as if you have to cut up your magazine, is it?

Data Protection Act: the information on the entry forms will be entered on to computers for use by Gordon Harwood Computers and Future Publishing Limited. If you do not want your details so used, please make sure that you indicate this clearly on the card. AS

WORTH £80 EACH



Pen Pal: **the word processor with graphics support and a built-in database.**

ENTER USING THE SPECIAL TEAR OUT CARD BETWEEN PAGES 106 AND 107

QUESTIONS

If you live in the provinces like I do, you'll be used to the local TV continuity announcers getting themselves into a terrible tangle trying to join two unconnected programmes together in a clever link. The same fate awaits the setter of questions. Rather than fall into this trap, I'll leave the link between these questions and *Pen Pal* to your fertile imaginations.

Who is responsible these famous quotations?

QUESTION 1

"This is the way the world ends, not with a bang but a whimper"

- **A** George Elliot
- **B** Peter Elliot
- **C** T S Elliot

QUESTION 2

"To love oneself is the beginning of a lifelong romance"

- **A** Oscar Wilde
- **B** W C Fields
- **C** W G Grace

QUESTION 3

"We are just statistics, born to consume resources"

- **A** Arnold Schumacher
- **B** Jonathan Porritt
- **C** Horace

QUESTION 4

"God is subtle but he is not malicious"

- **A** Archbishop George Carey
- **B** Pope John Paul II
- **C** Albert Einstein

HiSoft BASIC

A BASIC Standard

HiSoft BASIC is the answer to your programming prayers; a fast, interactive and easy-to-use 68000 BASIC system conforming to the industry standard for the BASIC language.

HiSoft BASIC is designed to be as compatible as possible with the AmigaBASIC interpreter, while offering you a friendlier, easier-to-use and infinitely more powerful language. In addition it has many of the features of the world-standard Microsoft QuickBASIC, on the PC.

Some of HiSoft BASIC's features include:

- *Structured programming, using long IFs, multi-line functions, CASE, REPEAT and procedures*
- *Program line numbers are optional, and alphanumeric labels can be used*
- *Full recursion for procedures & functions; local variables and arrays as parameters*
- *Five types of variables*
- *Program size limited only by memory*
- *Variable size limited only by memory*
- *Integer and character constants*
- *Compiles the majority of AmigaBASIC programs without change*

Full support of the Amiga is included as standard with extensive window, screen and graphics commands. Amiga libraries can also be accessed as if they were built-in statements allowing complete machine access.

HiSoft BASIC includes full MENU support, with event trapping and powerful sprite routines, using the OBJECT keywords.

Programs can execute in their own window(s) or use the CLI window for minimum size. CLI-type programs may be easily written and made resident since they are fully re-entrant.

HiSoft BASIC is a no-limits language; string variables may be up to 16Mbytes in length and there are no limits on array sizes either (subject to available memory). Code generated is fully 68010/020/030 compatible.

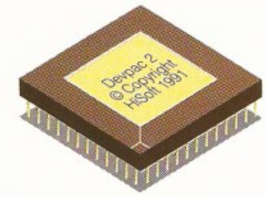
Compiled programs have no run-time overhead; all compiled programs share an Amiga library, which may be distributed with programs without charge.

Extend

An add-on package for HiSoft BASIC, Extend includes routines for handling IFF files, gadgets, sub-menus, sound, HAM mode and much more. It is supplied as a library for ease of use.

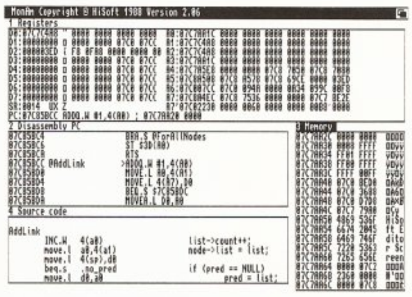
Normally HiSoft BASIC costs £79.95 and Extend costs £24.95 … but see the coupon below for a very special offer for the two packages together!

Devpac 2



Easy Assembly Language

Devpac Amiga Version 2 is widely regarded as the most powerful, complete, assembly language development system for the Amiga. It incorporates an integrated editor/assembler/linker/debugger, together with a stand-alone assembler and debugger and all the necessary include files and many examples.

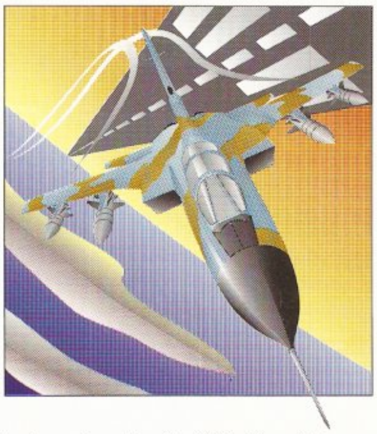


Complete with extensive ring-bound manual detailing all aspects of the package, plus debugging strategies, Devpac is *the* choice for beginners and assembler experts alike.

RRP is £59.95, but see the coupon below for a very special offer on this essential package.

ProFlight takes off!

ProFlight, the extremely accurate and flyable Tornado flight simulator from HiSoft, is *now* available for all the Amiga computers.



First released on the Atari ST where it has won a high degree of critical acclaim from reviewers and users alike, ProFlight is not only one of the most technically realistic simulators around but it is also tremendous fun to fly. As you would expect, the Amiga version has much improved sound and graphics!

You can fly peaceful reconnaissance missions or roar into attack after carefully planning your combat mission. ProFlight is supplied with a comprehensive, ring-bound flight manual.

SAS C5

SAS Institute (the parent company of Lattice Inc.) has taken over the development and sales of the Lattice C 5 compiler for the Amiga and released a new version, 5.10a.

The major features of this latest version are:

AmigaDOS 2.0 support, LSE AREXX support, improved Workbench usage, many performance improvements, support of _aligned, automatic near to far conversion, C++-style comments, compile/link options now read from an environment variable … and more.

We believe that these improvements and enhancements in this version establish SAS C5 as the ultimate Amiga C compiler. The package includes 680x0 compiler, linker, screen editor, assembler, highly intelligent global optimiser, source level debugger, code profiler, librarian and a host of tools and examples.

SAS C5 from HiSoft costs £229 (but see our special offer on the coupon) and includes full UK technical support, which is not available from other sources.

Upgrades cost £34.95 (from version 5.0x), £79 (from version 4.xx) or £99 (from version 3.xx).

Priority Order Form

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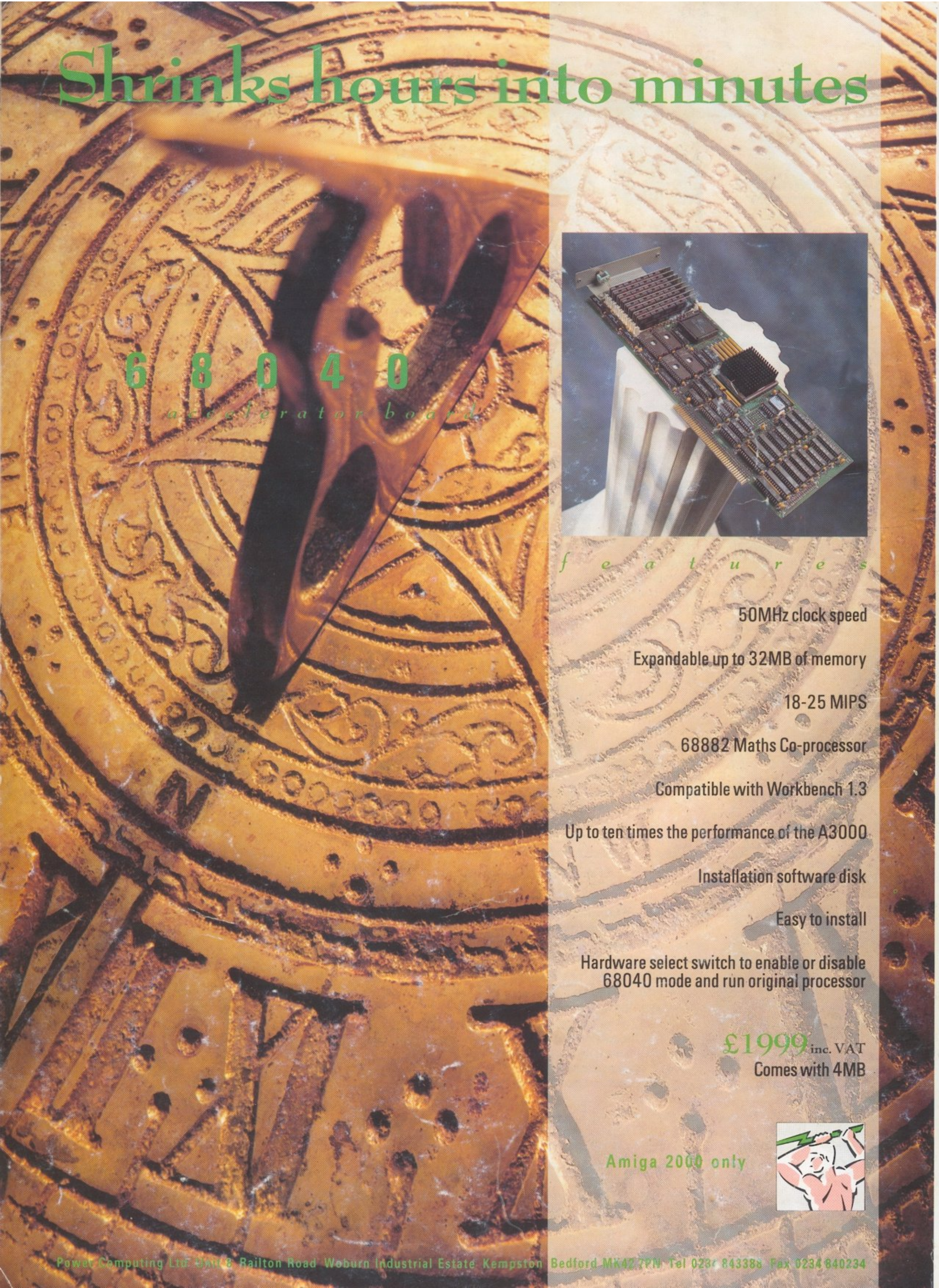
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